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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,120,003, Re. S.N. 496,485, Filed May 20, 1983, Cl. 358/142, MULTIPLE CHANNEL CATV SYSTEM UTILIZING ROW GRABBER INTERFACE AS CATV INPUT, David S. Mitchell, et al., Owner of Record: *IDR, Inc., Farmingdale, N.Y.,* Attorney or Agent: Lawrence G. Kurland, et al., Ex. Gp.: 233

4,125,613, Re. S.N. 478,756, Filed Mar. 25, 1983, Cl. 424/250, PESTICIDAL CINNOLINES, John S. Badmin, et al., Owner of Record: *Shell Oil Co., Houston, Tex.,* Attorney or Agent: Frank R. Lafontaine, Ex. Gp.: 125

4,146,657, Re. S.N. 510,967, Filed July 5, 1983, Cl. 427/126, METHOD OF DEPOSITING ELECTRICALLY CONDUCTIVE, INFRA-RED REFLECTIVE, TRANSPARENT COATINGS OF STANNIC OXIDE, Roy G. Gordon, Owner of Record: *Inventor,* Attorney or Agent: Andrew F. Kehoe, et al., Ex. Gp.: 162

4,242,033, Re. S.N. 507,224, Filed June 23, 1983, Cl. 414/662, MACHINE AND METHOD FOR VERTICAL TRANSPORTATION OF CONTAINERS, Stephen H. Aidlin, et al., Owner of Record: *Aidlin Automation, Inc., Brooklyn, N.Y.,* Attorney or Agent: Erwin S. Teltscher, Ex. Gp.: 312

4,252,914, Re. S.N. 512,301, Filed July 11, 1983, Cl. 525/098, THERMOPLASTIC ELASTOMER BLENDS OF HYDROGENATED POLYBUTADIENE BLOCK COPOLYMERS WITH ALPHA-OLEFIN POLYMERS AND COPOLYMERS, Adel F. Halasa, et al., Owner of Record: *Firestone Tire and Rubber Co., Akron, Ohio,* Attorney or Agent: D. A. Thomas, et al., Ex. Gp.: 143

4,272,484, Re. S.N. 500,772, Filed June 3, 1983, Cl. 422/58, FILLING FOR OPTODES, Dietrich W. Lubbers, Owner of Record: *Max-Planck-Gesellschaft Zur Forderung der Wissenchaften E.V., Gottingen, Germany,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 177

4,274,994, Re. S.N. 506,558, Filed June 21, 1983, Cl. 260/40R, REACTIVE TERMINALLY UNSATURATED LIQUID POLYMERS IN UNSATURATED POLYESTERS, Changkiu Keith Riew, Owner of Record: *B. F. Goodrich Co., New York, N.Y.,* Attorney or Agent: Nestor W. Shust, et al., Ex. Gp.: 142

4,278,874, Re. S.N. 512,434, Filed July 8, 1983, Cl. 219/505, HEATING CIRCUITS, Graham Malcolm Cole, Owner of Record: *Dreamland Electrical Appliances Ltd., Southampton, England,* Attorney or Agent: Thomas B. van Poole, Ex. Gp.: 213

4,286,766, Re. S.N. 507,755, Filed June 27, 1983, Cl. 249/144, COLLAPSIBLE MOLD CORE, John W. von Holt, Owner of Record: *Inventor,* Attorney or Agent: Charles F. Pigott, Ex. Gp.: 147

4,295,429, Re. S.N. 502,423, Filed June 8, 1983, Cl. 105/197DB, RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY, Donald Wiebe, Owner of Record: *A. Stucki Co., Pittsburgh, Pa.,* Attorney or Agent: E. Wallace Breisch, Ex. Gp.: 312

4,353,320, Re. S.N. 497,059, Filed May 23, 1983, Cl. 114/267, UTILITY DISTRIBUTION SYSTEM FOR MARINE FLOATS, Wesley W. Sluys, Owner of Record: *Builders Concrete, Inc., Bellingham, Wash.,* Attorney or Agent: Richard W. Seed, et al., Ex. Gp.: 315

4,372,270, Re. S.N. 510,455, Filed July 1, 1983, Cl. 123/440, METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTIBLE MIXTURE OF AN ENGINE, Reinhard Latsch, et al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany,* Attorney or Agent: Edwin E. Greigg, Ex. Gp.: 342

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,337,805, Reexam. No. 90/000,436, Requested: Aug. 22, 1983, Cl. 141/71, AGRICULTURAL BAG LOADING APPARATUS, William C. Johnson, et al., Owner of Record: *AG-Bag Corp., Arlington, Nebr.,* Attorney or Agent: Richards, Harris & Medlock, Ex. Gp.: 243, Requester: American Bag All Corp., Fawn Grove, Pa.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 20, 1983

3,874,422	4,371,955	4,381,014	4,390,558
4,180,854	4,372,403	4,381,230	4,390,613
4,200,603	4,372,645	4,381,253	4,390,725
4,202,697	4,373,357	4,381,991	4,391,157
4,231,782	4,373,459	4,382,664	4,391,308
4,259,086	4,373,862	4,382,872	4,391,316
4,261,497	4,374,200	4,382,873	4,391,373
4,307,149	4,374,759	4,383,057	4,391,488
4,307,224	4,375,096	4,383,094	4,391,751
4,316,869	4,375,615	4,383,648	4,391,866
4,318,688	4,375,734	4,384,379	4,392,011
4,343,928	4,375,945	4,384,993	4,392,987
4,347,149	4,376,105	4,385,044	4,392,997
4,349,650	4,376,583	4,385,988	4,393,094
4,351,031	4,377,193	4,386,881	4,393,240
4,358,582	4,377,440	4,387,022	4,393,562
4,358,860	4,378,142	4,387,109	4,393,799
4,362,040	4,378,346	4,388,002	4,393,878
4,363,859	4,378,386	4,388,289	4,393,959
4,366,257	4,379,398	4,388,618	4,394,200
4,369,712	4,379,832	4,389,443	4,394,202
4,369,838	4,380,279	4,389,619	4,394,262
4,370,302	4,380,542	4,389,726	4,394,722
4,370,330	4,380,616	4,389,865	4,394,738
4,370,878	4,380,696	4,389,908	4,395,476
4,371,530	4,380,909	4,389,914	
4,371,587	4,380,945	4,390,052	

Disclaimers

3,524,484.—*Richard G. Miller,* Elgin, Ill. ADJUSTABLE NOSEPIECE FOR POWER SCREWDRIVER. Patent dated Aug. 18, 1970. Disclaimer filed July 18, 1983, by the assignee, *Illinois Tool Works, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,061,755.—*Larry R. McDougald,* Greenfield, Ind. COCCIDIOCIDAL COMBINATION OF MONENSIN AND METICHLORPINDOL. Patent dated Dec. 6, 1977. Disclaimer filed Aug. 8, 1983 by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to all claims of said patent.

4,144,690.—*Peter J. Avery,* Toronto, Canada. CONCRETE FORMING STRUCTURES. Patent dated Mar. 20, 1979. Disclaimer filed Jan. 11, 1983, by the assignee, *Aluma Systems, Inc.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

4,309,033.—*Charles L. Parker, Jr.* and *George A. Vaughn,* Princeton, N.J. CLAMPING APPARATUS. Patent dated Jan. 5, 1982. Disclaimer filed Aug. 8, 1983, by the assignee, *AMF Inc.*

Hereby enters this disclaimer to claims 1–7 and 12–14 of said patent.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Parts 1 and 2

[Docket No. 30719-138]

Attorney Disciplinary Rules

AGENCY: Patent and Trademark Office, Commerce

ACTION: Notice of proposed rulemaking

SUMMARY: The Patent and Trademark Office proposes to revise the rules of practice in patent and trademark cases, concerning standards of conduct and disciplinary procedures for attorneys and agents recognized to practice before the Office. The present rules do not go into detail as to the obligations arising under the standards of conduct, or as to the procedures for investigating complaints and conducting disciplinary actions. The proposed rules would spell out the obligations of those who practice before the Office, and the procedures for enforcing them, in sufficient detail to better achieve an even-handed regulation of the practice of attorneys and agents before the Office. The proposed rules would also reassign responsibility for administering these rules. However, the proposed rules would not change the current requirements and procedures for gaining recognition to represent applicants or other parties before the Office.

DATES: Comments must be received on or before September 29, 1983; a public hearing will be held September 29, 1983, beginning at 9:00 AM. Requests to present oral testimony should be received by September 22, 1983.

ADDRESS: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of William Feldman. The hearing will be held in Room 11C24 of Building 3, Crystal Plaza, located at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11A13 of Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: William Feldman, by telephone at (703) 557-2012 or by mail marked to his attention and addressed as indicated above.

SUPPLEMENTARY INFORMATION: This proposed rule change is designed in part to clarify the standards of professional conduct to which attorneys and agents must conform in representing applicants or other parties before the Patent and

Trademark Office. Sections 1.344 and 2.13, if amended as proposed, would require attorneys, agents and other persons appearing before the Office in patent and trademark cases, respectively, to conform to the standards of ethical and professional conduct set forth in the American Bar Association's current Code of Professional Responsibility. This change, coupled with the removal of §§1.345 and 2.14 which prohibit advertising, and the addition of §1.349, would make the rules consistent with the decisions of the United States Supreme Court in Bates v. State Bar of Arizona, 433 U.S. 350 (1977); Ohralik v. Ohio State Bar Association, 436 U.S. 447 (1978); and In re Primus, 436 U.S. 412 (1978).

Additional changes in §§1.344 and 2.13 are proposed which would specifically prohibit patent agents registered to practice under §§1.341(b) or 1.341(e) and persons recognized to practice under §§2.12(b) or 2.12(c), from holding themselves out to be an attorney, solicitor or lawyer. The prohibition would include all forms of communication since such representation would not only be false, deceptive and misleading but a misrepresentation of the authority granted the individual by virtue of their recognition to represent clients in patent and trademark cases. This prohibition has been added so that non-lawyers bound by a lawyer's code of responsibility will not mistakenly assume they can style themselves as lawyers.

A new §1.349 is proposed to prohibit advertising and solicitation specifically proscribed in 35 U.S.C. 32.

A new §1.360 is proposed to define the Commissioner's authority to conduct disciplinary proceedings.

The addition of a new §1.361 further concerning professional conduct is proposed. This proposed new section defines by means of a non-exclusive listing, conduct which is considered prima facie disreputable and would result in suspension or exclusion from practice. The purpose of this section is to augment §§1.344 and 2.13 which require adherence to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association.

New §1.362 is proposed to replace §1.348(a). This section provides for a Director of Enrollment and Discipline. Under §1.362(b) the Director is assigned the responsibility previously assigned to the Solicitor for conducting investigations, preparing charges, collecting and presenting testimony, and presenting cases for suspension or exclusion from practice of attorneys and registered agents admitted to practice before the Office. Establishing the position of Director of Enrollment and Discipline will provide separation of the discipline function from the duties of the Solicitor and a full time investigative office to which complaints can be specifically directed. Moreover, the Solicitor will be available to counsel the Commissioner on disciplinary matters without conflict of

interest problems since the Solicitor will not have been involved in the investigation or presentation of the case for suspension or exclusion.

Proposed §§1.363-1.379 would specify in detail the procedures for initiation and conduct of disciplinary proceedings and would replace §1.348(b)-(e). Specifically, §1.363(a) would require disreputable conduct to be reported to the Director of Enrollment and Discipline. Section 1.363(b) would impose a duty on attorneys and registered agents to supply information concerning violation of the regulations to the Director of Enrollment and Discipline. Sections 1.363(c) and 1.364(a) would encourage the Director of Enrollment and Discipline to correspond and confer with a proposed respondent prior to instituting disciplinary proceedings. Section 1.364(b) would allow the Director of Enrollment and Discipline to accept resignations or voluntary suspensions in lieu of instituting disciplinary proceedings.

Proposed §1.363(c) would replace §1.348(b) and require the Director of Enrollment and Discipline to file a formal complaint to institute disciplinary proceedings. Section 1.365 would require the complaint to be plain and concise, and sets forth a time limit for respondent to file an answer to the complaint. This is not a significant departure from existing practice.

Proposed §1.366(a) is new to the rules and would provide methods for serving the complaint and obtaining proof of service. Section 1.366(b) similarly would provide for service of papers other than the complaint and would authorize the Administrative Law Judge or Commissioner to require express mail or hand delivery if warranted.

Proposed §1.367 would replace §1.348(c) and require the respondent to file an answer to the complaint which fully responds to each allegation of the complaint and also states any affirmative defenses. This would not be a significant departure from existing practice.

Proposed §1.367(e) would authorize use of a subpoena under 35 U.S.C. 24 to obtain evidence once an answer to the complaint has been filed.

Proposed §1.370 would provide for the filing of motions. Under this section the moving party would be required to confer with the opposing party and make a good faith effort to resolve the issue raised by the motion before making the motion. This section is new and is designed to expedite disciplinary proceedings by reducing issues.

Proposed §1.372 would replace §1.348(e) and provide for the appointment of an Administrative Law Judge to preside over disciplinary proceedings. Specific responsibilities of the Administrative Law Judge are delineated in §1.372(b). Requiring an Administrative Law Judge to preside over disciplinary

proceedings is designed to insure that the presiding official will be competent and experienced in deciding matters such as admissibility of evidence, etc.

Under proposed §1.373, disciplinary hearings would be held in all cases. The hearings would be recorded and transcribed. This section would replace §1.348(d) but would not depart significantly from present practice.

Under proposed §1.374, disciplinary hearings would not be open to the public unless the respondent requests an open hearing and the Director of Enrollment and Discipline does not object. Although the current rules are silent on this point, this is consistent with present practice.

Proposed §1.375 would provide general rules of evidence to be followed in hearings in disciplinary proceedings. Specific guidelines for taking depositions are set forth in proposed §1.376. This section would replace §1.348(d)(3) and specifically set time limits and conditions broadly referenced in the predecessor section.

Under proposed §1.377, specific guidelines for discovery and limitations on discovery are set forth. This section would depart from past practice but is consistent with the Court of Appeals' decision in Silverman v. Commodity Futures Trading Commission, 549 F.2d 28 (7th Cir. 1977).

Under proposed §1.378, the parties would have the right to file proposed findings and conclusions and a post-hearing memorandum prior to the initial decision of the Administrative Law Judge.

Under proposed §1.379, the Administrative Law Judge would be required to file a written initial decision in the case within six months from the date the complaint is served. This would be a significant departure from present practice under which no time limit is prescribed for filing the initial decision. This section is designed to expedite disciplinary proceedings.

Under proposed §1.380, either party may appeal the initial decision of the Administrative Law Judge to the Commissioner within thirty days of the initial decision. The Commissioner would make a final decision under proposed §1.381 after allowing the other party thirty days to file a reply brief. As in the past the respondent may seek review of the Commissioner's decision by petitioning the United States District Court for the District of Columbia.

Proposed §1.382(a) and (b) set forth the consequences of suspension or exclusion from practice as they now exist. Under proposed §1.382(c) a further sanction of revocation of privileges would be possible. This sanction is designed to prevent suspended or excluded practitioners from circumventing

the disciplinary action taken by the Office. Proposed §1.382(d) would provide for publication of the final order of suspension or exclusion from practice. Such publication is believed necessary to effect the disciplinary sanction under §1.382 and discourage disreputable conduct under proposed §1.361(f).

Under proposed §1.383 an excluded practitioner may petition for reinstatement after five years. In addition, this section suggests that a further penalty, the costs of the disciplinary proceeding plus interest, may be levied against an excluded or suspended practitioner as a condition for reinstatement.

Under proposed §2.16 attorneys and other persons representing applicants in trademark cases would be held to the same standards of professional conduct as registered attorneys and agents representing applicants in patent cases. Procedures governing disciplinary proceedings and reinstatement as specifically provided in §§1.362-1.383 would apply as well to trademark practitioners.

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change is in conformity with requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.SC. 3501 et seq.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Advertising, Courts, Freedom of Information, Inventions and patents, Investigations, Lawyers, Legal Services, Trademarks.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 31 and 32, the Patent and Trademark office proposes to

amend Title 37 of the Code of Federal Regulations as set forth below.

It is proposed to amend 37 CFR Parts 1 and 2 as follows with deletions indicated by brackets and additions by arrows.

PART I - [AMENDED]

1. §1.344 is proposed to be amended by designating the existing paragraph as paragraph (a), revising newly designatedparagraph (a) and adding a new paragraph (b) to read as follows:

§1.344 PROFESSIONAL CONDUCT

▶(a)◀ Attorneys and agents appearing before the Patent and Trademark Office must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association [as amended February 24, 1970,] insofar as such code is not inconsistent with ▶Chapter I of◀ this ▶title◀ [part] . A copy of the said code is available for inspection in the Office of the [Solicitor] ▶Director of Enrollment and Discipline◀, U.S. Patent and Trademark Office, Room [11C04] ▶11E14◀, Building [3] ▶4◀, Crystal Plaza, [2021] Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 E. 60th Street, Chicago, Ill. 60637.

▶(b) An agent registered to practice under §§1.341(b) or 1.341(e) shall not hold himself or herself out to be an attorney, solicitor or lawyer.◀

2. §1.345 is proposed to be removed as follows:

§1.345 [Advertising.] ▶Reserved◀

[(a) The use of advertising, circulars, letters, cards, and similar material to solicit patent business, directly or indirectly, is forbidden as unprofessional conduct, and any person engaging in such solicitation, or associated with or employed by others who so solicit, shall be refused recognition to practice before the Patent and Trademark Office or may be suspended, excluded or disbarred from further practice.

(b) The use of simple professional letterheads, calling cards, or office signs, simple announcements necessitated by opening an office, change of association, or change of address, distributed to clients and friends, and insertion of listings in common form (not display) in a classified telephone or city directory, and listings and professional cards with biographical data in standard professional directories shall not be considered a violation of this rule.

(c) No agent shall, in any material specified in paragraph (b) of this section or in papers filed in the Patent and

Trademark Office, represent himself to be an attorney, solicitor or lawyer.]

3. §1.348 is proposed to be removed as follows:

§1.348 [SUSPENSION OR DISBARMENT PROCEEDINGS] ▶ Reserved ◀

[Except as otherwise provided, proceedings for suspension, disbarment or exclusion from practice are before a Commissioner.

(a) Investigating and prosecuting officer. The duties of investigation, preparing charges, collecting and presenting testimony, and presenting a case for suspension, exclusion from practice or disbarment shall be performed by the Solicitor of the Patent and Trademark Office or, at his direction, by a designated law examiner or other person, and neither the Solicitor nor such law examiner or other person shall participate in any manner in the decision of the case. If, upon investigation of a complaint or other information concerning an attorney or agent, it shall appear to the Solicitor that grounds for suspension, exclusion from practice, or disbarment exist, he shall prepare and forward the necessary notice and statement.

(b) Notice of proceedings. Proceedings for suspension or disbarment shall be instituted by the Solicitor by mailing to, or otherwise serving on, the respondent a notice of such proceeding with a statement of the charges against him, at the same time forwarding a copy to the Commissioner. It shall be the duty of the respondent to answer the charges as specified in paragraph (c) of this section.

(c) Answer. The respondent's answer shall be filed in writing with the Commissioner within one month from the time the notice is served on the respondent, or within such extension of time as may be allowed by the Commissioner for good cause shown. The answer shall be under oath or declaration. Failure to answer within the time allowed will be taken as an admission of the charges. The respondent in his answer should specifically admit or deny every material allegation of fact in the statement of charges; every allegation not denied shall be deemed admitted, unless the respondent states that he has no knowledge thereof sufficient to form a belief, which statement shall be considered a denial. Any special matters of defense shall be stated affirmatively in the answer. False statements in the answer may be made the basis of supplemental charges.

(d) Hearing. (1) Unless the Commissioner finds the answer sufficient to dispose of the charges, he will set the case for hearing before him, notifying the respondent and the Solicitor of the place, day and time of commencement of the hearing. Evidence as to the matters in issue may be submitted at the hearing, the testimony of witnesses being presented orally, under oath and reported.

(2) The hearing may be advanced and continued by the Commissioner as far as may be deemed convenient and proper.

(3) Depositions for use at the hearing in lieu of personal appearance of witnesses may be taken by either the Solicitor or the respondent on application to and with the written consent of the Commissioner within such times and under such conditions as the Commissioner may prescribe.

(e) Hearing Officer. The Commissioner may, in his discretion, delegate the conduct of the hearing to a hearing or trial examiner who shall be the presiding officer and who shall make a recommended decision.

(f) Administrative Procedure Act. Proceedings shall be governed, in matters not specifically set forth herein, by the provisions of the Administrative Procedure Act, 60 Stat. 237; 5 U.S.C. 1001-1011, which may be applicable.]

4. §1.349 is proposed to be added and reads as follows:

▶§1.349 ADVERTISING AND SOLICITATION◀

▶No attorney or registered agent shall with respect to any prospective business before the Patent and Trademark Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead or threaten any prospective applicant or other person having prospective business before the Office.◀

§1.351 [Redesignated as §1.391]

5. §1.351 is proposed to be redesignated as §1.391. The center heading "Amendment of Rules" is transferred to appear above §1.391.

§1.352 [Redesignated as §1.392.]

6. §1.352 is proposed to be redesignated as §1.392.

7. §1.360 is proposed to be added and reads as follows:

▶§1.360 SUSPENSION OR EXCLUSION FROM PRACTICE◀

▶The Commissioner, after notice and opportunity for hearing, may suspend or exclude from practice before the Patent and Trademark Office either generally or in any particular case, any person, attorney or registered agent shown to be incompetent, disreputable or guilty of unethical or unprofessional conduct or gross misconduct, or who does not comply with the rules and regulations in Chapter I of this title.◀

8. §1.361 is proposed to be added and reads as follows:

▶§1.361 DISREPUTABLE CONDUCT◀

▶Disreputable conduct for which an attorney or registered agent may be suspended or excluded from practice before the Patent and Trademark Office includes, but is not limited to:

(a) Conviction of any criminal offense under any law of the United States or any state thereof or for any offense involving dishonesty or breach of trust.

(b) Giving false or misleading information, or participating in any way in the giving of false or misleading information, to the Patent and Trademark Office or any employee thereof, or to any tribunal authorized to pass upon matters administered by the Patent and Trademark Office in connection with any matter pending or likely to be pending before them, knowing the information to be false or misleading. Facts or other matters contained in testimony, applications for patents or trademarks, affidavits, declarations, or any other document or statement, written or oral, are included in the term "information."

(c) Misappropriation of, or failure properly and promptly to remit funds received from a client for the purpose of payment of fees to the Commissioner.

(d) Directly or indirectly attempting to influence, or offering or agreeing to attempt to influence, the official action of any employee of the Patent and Trademark Office by the use of threats, false accusations, duress or coercion, by the offer of any special inducement or promise of advantage or by the bestowing of any gift, favor, or thing of value.

(e) Disbarment or suspension from practice as an attorney by any duly constituted authority of any State, Possession, Commonwealth, the District of Columbia, or by any Federal Court.

(f) Knowingly aiding and abetting another person to practice before the Patent and Trademark Office during a period of suspension, exclusion, or ineligibility of the other person. Maintaining a partnership for the practice of law, or other related professional service with a person who is under suspension or exclusion from practice before the Patent and Trademark Office is presumed to be a violation of this provision.

(g) Contemptuous conduct in connection with practice before the Patent and Trademark Office, including the use of abusive language, making false accusations and statements knowing them to be false, or circulating or publishing malicious or libelous matter.

(h) Knowingly withholding from the Patent and Trademark Office information identifying a patent from which a claim(s) has (have) been copied.

(i) Refusing or neglecting to forward correspondence received on behalf of a former client to that client or to notify the Patent and Trademark Office of the inability to forward such correspondence.◀

9. §1.362 is proposed to be added and reads as follows:

▶§1.362 DIRECTOR OF ENROLLMENT AND DISCIPLINE◀

▶(a) Appointment. The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director of Enrollment and Discipline or a vacancy in that office the Commissioner shall designate an employee of the Patent and Trademark Office to act as Director of Enrollment and Discipline.

(b) Duties. The Director of Enrollment and Discipline shall: conduct investigations; prepare charges; collect and present testimony and present cases for suspension or exclusion from practice of the attorneys and registered agents admitted to practice before the Patent and Trademark Office. The Director may perform other duties as are necessary and appropriate to carry out the Director's functions under this part or as prescribed by the Commissioner. The Director shall not participate in deciding any case.◀

10. §1.363 is proposed to be added and reads as follows:

▶§1.363 INITIATION OF DISCIPLINARY PROCEEDINGS◀

▶(a) Receipt of information. If an employee of the Patent and Trademark Office has reason to believe that an attorney or registered agent has violated any of the provisions of this part, the employee shall promptly make a report thereof which will be forwarded to the Director of Enrollment and Discipline. Any other person possessing information concerning violations or disreputable conduct may make a report thereof to the Director of Enrollment and Discipline or to any employee of the Patent and Trademark Office.

(b) Furnishing information. It is the duty of an attorney or registered agent who practices before the Patent and Trademark Office, when requested by the Director of Enrollment and Discipline, to provide the Director with any information the person may have concerning violation of the regulations in this part by any other person, and to testify thereto in any proceeding instituted under this part for the suspension or exclusion from practice of an attorney or registered agent, unless the person believes in good faith and on reasonable grounds that that information is privileged or that the request is of doubtful legality.

(c) Institution of proceeding. When the Director of Enrollment and Discipline has reason to believe that any attorney or registered agent has violated any provisions of the

laws or regulations governing practice before the Patent and Trademark Office, the Director may reprimand the person or institute a disciplinary proceeding for the suspension or exclusion from practice of that person. The proceeding will be instituted by a complaint which names the respondent and is signed by the Director of Enrollment and Discipline and filed in the Director's office. Except in cases of willfulness, or when time, the nature of the proceeding, or the public interest does not permit, the Director of Enrollment and Discipline may not institute a proceeding until the Director has called to the attention of the proposed respondent, in writing, facts or conduct which warrant institution of a proceeding, and has accorded the proposed respondent the opportunity to demonstrate or achieve compliance with all lawful requirements. An Administrative Law Judge will be appointed at the time the complaint is filed. A copy of the complaint will be given to the Administrative Law Judge.◀

11. §1.364 is proposed to be added and reads as follows:

▶§1.364 CONFERENCES◀

▶(a) General. The Director of Enrollment and Discipline may confer with an attorney or registered agent concerning allegations of misconduct whether or not a proceeding for suspension or exclusion from practice has been instituted.

(b) Resignation or voluntary suspension. An attorney or registered agent may avoid the institution or conclusion of a suspension or exclusion proceeding by offering his or her consent to suspension from practice before the Patent and Trademark Office. A registered agent may also offer a resignation. The Director of Enrollment and Discipline, at his or her discretion, may accept the offered resignation of a registered agent and may suspend an attorney or registered agent in accordance with the consent offered. Revocation of the privilege of using the Public Search Room and other facilities of the Patent and Trademark Office to perform work on behalf of others may be a condition of suspension or acceptance of resignation.◀

12. §1.365 is proposed to be added and reads as follows:

▶§1.365 CONTENTS OF COMPLAINT◀

▶(a) Charges. A complaint will give a plain and concise description of the allegations which constitute the basis for the proceeding. A complaint will be deemed sufficient if it fairly informs the respondent of the charges so that respondent is able to prepare a defense.

(b) Demand for answer. The complaint will state the place and time for filing an answer by the respondent. The time will be not less than fifteen (15), and no more than thirty (30), calendar days from the date of service of the complaint. Notice

will be given that a decision by default may be rendered against the respondent if the complaint is not answered as required.◀

13. §1.366 is proposed to be added and reads as follows:

▶§ 1.366 SERVICE OF COMPLAINT AND OTHER PAPERS◀

▶(a) Complaint. A copy of the complaint may be served upon the respondent by certified mail or by first-class mail sent to respondent's last address known to the Director of Enrollment and Discipline. The copy of the complaint may be delivered to the respondent or the respondent's attorney of record either in person or by leaving it at the office of the respondent, or attorney, or the complaint may be delivered in any manner which has been agreed to by the respondent. If service is by certified mail, the post office receipt signed by or on behalf of the respondent will be proof of service. If the certified mail is not claimed or accepted by the respondent and is returned undelivered, complete service may be made upon the respondent by mailing the complaint to respondent by first-class mail, addressed to the respondent at the address on file with the Committee on Enrollment or at the last address known to the Director of Enrollment and Discipline. If service is made upon the respondent or the respondent's attorney in person, or by leaving the complaint at the office of the respondent, or attorney , the verified return by the person making service, setting forth the manner of service, will be proof of service. If respondent is a registered agent or attorney a letter pursuant to §1.347 may be sent with the complaint. Respondent shall respond to said letter within fifteen (15) days from the date of the letter and such response shall constitute proof of service.

(b) Service of other papers. Any paper other than the complaint may be served upon an attorney or registered agent as provided in paragraph (a) of this section, or by mailing the paper by first-class mail to the respondent's attorney of record or if respondent is not represented by an attorney by mailing the paper by first-class mail to the respondent at the address on file with the Committee on Enrollment or at the last address known to the Director of Enrollment and Discipline. This mailing will constitute complete service. The Administrative Law Judge or Commissioner may require that service of papers be made by express mail or hand delivery.

(c) Filing of papers. When the filing of a paper is required or permitted in connection with a disciplinary proceeding, and the place of filing is not specified by this section or by rule or order of the Administrative Law Judge or by direction of the Director of Enrollment and Discipline, the papers should be filed with the Director of Enrollment and Discipline, Patent and Trademark Office, Washington, D.C. 20231. All papers will be filed in duplicate.◀

14. §1.367 is proposed to be added and reads as follows:

▶§1.367 ANSWER◀

▶(a) Filing. The respondent shall file an answer in writing with the Administrative Law Judge within the time specified in the complaint or notice of institution of the proceeding, unless, on application, the time is extended by the Director of Enrollment and Discipline or the Administrative Law Judge. A copy of the answer shall be served on the Director of Enrollment and Discipline.

(b) Contents. The respondent shall include in the answer a statement of facts which constitute the grounds of defense, and shall specifically admit or deny each allegation set forth in the complaint, except that the respondent shall not deny a material allegation in the complaint which respondent knows to be true, or state that respondent is without sufficient information to form a belief when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.

(c) Failure to deny or answer allegations in the complaint. Every allegation in the complaint which is not denied in the answer is deemed to be admitted and may be considered proven, and no further evidence in respect of that allegation need be adduced at a hearing. Failure to file an answer within the time prescribed in the notice to the respondent, except as the time for answer is extended by the Director of Enrollment and Discipline or the Administrative Law Judge, will constitute an admission of the allegations of the complaint and a waiver of hearing, and the Administrative Law Judge may render a decision by default without a hearing or further procedure.

(d) Reply by Director of Enrollment and Discipline. No reply to the respondent's answer is required, and new matter in the answer shall be deemed to be denied, but the Director of Enrollment and Discipline may file a reply at the Director's discretion or at the request of the Administrative Law Judge.

(e) Contested Case. Upon the filing of an answer by respondent the proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. §24. Evidence obtained by subpoena shall not be admitted into the record or considered unless the subpoena was previously authorized by the Administrative Law Judge.◀

15. §1.368 is proposed to be added and reads as follows:

▶§1.368 SUPPLEMENTAL CHARGES◀

▶If it appears that the respondent's answer, falsely and in bad faith, denies a material allegation of fact in the complaint or states that the respondent has no knowledge or information

sufficient to form a belief, when respondent in fact possesses knowledge or that information, or if it appears that the respondent has knowingly introduced false testimony during proceedings for respondent's suspension or exclusion from practice the Director of Enrollment and Discipline may file supplemental charges against the respondent. These supplemental charges may be tried with other charges in the case, provided the respondent is given notice and is afforded an opportunity to prepare a defense to them.◀

16. §1.369 is proposed to be added and reads as follows:

▶§ 1.369 PROOF; VARIANCE; AMENDMENT OF PLEADINGS◀

▶In case of a variance between the evidence and the allegations in a pleading, the Administrative Law Judge may order or authorize amendment of the pleading to conform to the evidence. The party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegation of the pleading as amended, and the Administrative Law Judge shall make findings on an issue presented by the pleadings as so amended.◀

17. §1.370 is proposed to be added and reads as follows:

▶§ 1.370 MOTIONS◀

▶Motions may be filed with the Administrative Law Judge. The Administrative Law Judge will determine on a case-by-case basis the time period for response to a motion. No motion will be considered by the Administrative Law Judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by the motion are subsequently resolved between the parties the moving party should advise the Administrative Law Judge in writing of the matters in the motion which no longer require a decision.◀

18. §1.371 is proposed to be added and reads as follows:

▶§1.371 REPRESENTATION◀

▶A respondent or proposed respondent may appear in person or be represented by an attorney who need not be registered to practice before the Patent and Trademark Office. The Director of Enrollment and Discipline may be represented by an attorney or other employee of the Patent and Trademark Office.◀

19. §1.372 is proposed to be added and reads as follows:

▶§1.372 ADMINISTRATIVE LAW JUDGE◀

▶(a) Appointment. An Administrative Law Judge, appointed as provided by 5 U.S.C. 3105, shall conduct disciplinary proceedings.

(b) Responsibilities. The Administrative Law Judge shall have authority to:

(1) Administer oaths and affirmations;

(2) Make rulings upon motions and requests; these rulings may not be appealed prior to the close of the hearing except at the discretion of the Administrative Law Judge or the Commissioner in extraordinary circumstances;

(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;

(4) Take or authorize the taking of depositions;

(5) Determine the time and place of hearing and regulate its course and conduct;

(6) Hold or provide for the holding of conferences to settle or simplify the issues by consent of the parties;

(7) Receive and consider oral or written arguments on facts or law;

(8) Make initial decisions;

(9) Adopt procedures and modify them from time to time as occasion requires for the orderly disposition of proceedings; and

(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any proceeding.◀

20. §1.373 is proposed to be added and reads as follows:

▶§1.373 HEARINGS◀

▶(a) Conduct. The Administrative Law Judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The Administrative Law Judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director of Enrollment and Discipline and the respondent.

(b) Failure to appear. If either party to a disciplinary proceeding fails to appear at the hearing, after notice has been sent, the Administrative Law Judge may deem the absent party to have waived the right to a hearing and may make a decision against the absent party by default.◀

21. §1.374 is proposed to be added and reads as follows:

▶§1.374 HEARINGS AND RECORDS◀

▶A hearing in a disciplinary proceeding will not be open to the public except that the Director of Enrollment and Discipline may grant a request by a respondent to open his or her hearing to the public and make the record of the proceeding available for public inspection provided agreement is reached by stipulation in advance to exclude from public disclosure information which is privileged or confidential under applicable laws and regulations. However, if the hearing results in disciplinary action against an attorney or registered agent, the record of the proceeding will be available for public inspection.◀

22. §1.375 is proposed to be added and reads as follows:

▶§1.375 EVIDENCE◀

▶(a) Rules of evidence. The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the Administrative Law Judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(b) Depositions. Depositions of witnesses taken pursuant to §1.376 may be admitted as evidence.

(c) Government documents. Official documents, records, and papers of the Patent and Trademark Office are admissible in evidence without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Patent and Trademark Office.

(d) Exhibits. If any document, record, or other paper is introduced in evidence as an exhibit, the Administrative Law Judge may authorize the withdrawal of the exhibit subject to any conditions the Administrative Law Judge deems appropriate.

(e) Objections. Objections to evidence will be in short form, stating the grounds of objection and the record may not include arguments thereon, except as ordered by the Administrative Law Judge. Rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.◀

23. §1.376 is proposed to be added and reads as follows:

▶§1.376 DEPOSITIONS◀

▶Depositions for use at a hearing may, with the approval of the Administrative Law Judge, be taken by either the Director of Enrollment and Discipline or the respondent or their authorized

representatives. Depositions may be taken upon oral or written questions, upon not less than ten (10) days written notice to the other party, before any officer authorized to administer an oath for general purposes or before an employee of the Patent and Trademark Office authorized to administer an oath. The written notice will state the names of the witnesses and the time and place where the depositions are to be taken. The requirement of ten (10) days notice may be waived by the parties in writing, and depositions may then be taken from the persons and at the times and places mutually agreed to by the parties. When a deposition is taken upon written questions, any cross-examination will be upon written questions. Copies of the written questions will be served upon the other party with the notice, and copies of any written cross-interrogatories will be mailed or delivered to the opposing party at least five (5) days before the date of taking the deposition, unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken must file a transcript thereof with the Administrative Law Judge and serve one copy upon the opposing party. Expenses in the reproduction of depositions will be borne by the party at whose instance the deposition is taken.◀

24. §1.377 is proposed to be added and reads as follows:

▶§1.377 DISCOVERY◀

▶Discovery shall not be authorized except as follows:

(1) The Administrative Law Judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains

(a) a list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,

(b) a list of all proposed witnesses,

(c) the identity of government employees who have investigated the case and,

(d) copies of memoranda reflecting respondent's own statements to administrative representatives;

(2) After a witness testifies for a party, if the opposition requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness;

(3) Requests for admissions, filed within such time as may be authorized by the Administrative Law Judge, which are to be admitted or denied and if denied a brief reason given for denial.◀

25. §1.378 is proposed to be added and reads as follows:

▶§1.378 PROPOSED FINDINGS AND CONCLUSIONS◀

▶Except in cases when the respondent has failed to answer the complaint, or when a party has failed to appear at the hearing, the Administrative Law Judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.◀

26. §1.379 is proposed to be added and reads as follows:

▶§1.379 DECISION OF ADMINISTRATIVE LAW JUDGE◀

▶Within six (6) months from the date charges are served, the Administrative Law Judge shall make an initial decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefor, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension, exclusion from practice or reprimand or an order of dismissal of the complaint. The Administrative Law Judge shall file the decision with the Director of Enrollment and Discipline and shall transmit a copy to the respondent or the respondent's attorney of record. In the absence of an appeal to the Commissioner or review of the decision upon motion of the Commissioner, the decision of the Administrative Law Judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the Administrative Law Judge.◀

27. §1.380 is proposed to be added and reads as follows:

▶§1.380 APPEAL TO THE COMMISSIONER◀

▶Within thirty (30) days from the date of the initial decision of the Administrative Law Judge, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director of Enrollment and Discipline in duplicate and will include exceptions to the decision of the Administrative Law Judge and supporting reasons for those exceptions. If the Director of Enrollment and Discipline files the appeal, the Director shall transmit a copy of it to the respondent. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director of Enrollment and Discipline. If the Director files the reply brief, the Director shall transmit a copy of it to the respondent. Upon the filing of an appeal and a reply brief, if any, the Director of Enrollment and Discipline shall transmit the entire record to the Commissioner.◀

28. §1.381 is proposed to be added and reads as follows:

▶§1.381 DECISION OF THE COMMISSIONER◀

▶On appeal from or review of the initial decision of the Administrative Law Judge, the Commissioner shall make a final decision. In making this decision, the Commissioner shall review the record or those portions of the records as may be cited by the parties in order to limit the issues. The Director of Enrollment and Discipline shall transmit a copy of the Commissioner's decision to the respondent. Review of the Commissioner's action may be had by petition to the United States District Court for the District of Columbia.◀

29. §1.382 is proposed to be added and reads as follows:

▶§1.382 EFFECT OF SUSPENSION OR EXCLUSION◀

▶(a) Exclusion. If the final order against the respondent is for exclusion from practice, the respondent will not thereafter be permitted to practice before the Patent and Trademark Office in patent and trademark cases unless authorized to do so by the Committee on Enrollment or the Commissioner.

(b) Suspension. If the final order against the respondent is for suspension, the respondent will not thereafter be permitted to practice before the Patent and Trademark Office in patent and trademark cases during the period of suspension.

(c) Revocation of privileges. Revocation of the privilege of using the Public Search Room and other facilities of the Patent and Trademark Office, for work to be performed on behalf of others may be a condition of suspension or exclusion from practice.

(d) Notice of suspension or exclusion. Upon the issuance of a final order for suspension or exclusion from practice, the Director of Enrollment and Discipline shall give notice of the order to appropriate employees of the Patent and Trademark Office and to interested departments and agencies of the Federal Government. The Director of Enrollment and Discipline may also give notice to the proper authorities of the State in which, and any Courts before which, the suspended or excluded person is licensed to practice as an attorney.◀

30. §1.383 is proposed to be added and reads as follows:

▶§1.383 PETITION FOR REINSTATEMENT◀

▶The Committee on Enrollment may entertain a petition for reinstatement from any person excluded from practice before the Patent and Trademark Office after the expiration of five (5) years following exclusion. The Committee on Enrollment may grant reinstatement if it is satisfied that the petitioner will conduct himself or herself in accordance with these regulations, and that granting reinstatement would not be contrary to the public interest. In issuing a final order, the Commissioner may impose as a condition for reinstatement that the person seeking reinstatement pay all or a portion of the costs and expenses of

the proceedings which led to suspension or exclusion, plus interest thereon from the date of suspension.◀

31. §1.384 is proposed to be added and reads as follows:

▶§ 1.384 SAVING CLAUSE◀

A proceeding for suspension or exclusion based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of these revised regulations.

32. §1.385 is proposed to be added and reads as follows:

▶§1.385 SPECIAL ORDERS◀

The Commissioner reserves the power to issue such special orders as he may deem proper in any disciplinary proceeding.

PART 2 - [AMENDED]

33. §2.13 is proposed to be amended by designating the existing paragraph as paragraph (a), revising newly designated paragraph (a) and adding new paragraph (b) to read as follows:

§ 2.13 PROFESSIONAL CONDUCT

▶(a)◀ Attorneys and other persons appearing before the Patent and Trademark Office in trademark cases must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association [as amended February 24, 1970,] insofar as such code is not inconsistent with this part. A copy of the said code is available for inspection in the Office of the [Solicitor] ▶Director of Enrollment and Discipline◀, U.S. Patent and Trademark Office, Room [11C04] ▶11E14◀, Building [3] ▶4◀, Crystal Plaza, [2021] Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 East 60th Street, Chicago, Ill. 60637.

▶(b) Any person recognized to practice under §§ 2.12(b) and 2.12(c) is required to conform to the standards set forth in said Code of Professional Responsibility, and such person shall not hold himself or herself out to be an attorney, solicitor or lawyer.◀

34. §2.14 is proposed to be removed as follows:

§2.14 [Advertising] ▶Reserved .◀

[(a) The use of display advertising, circulars, letters, cards, and similar material to solicit trademark business, directly or indirectly, is forbidden as unprofessional conduct, and any person engaging in such solicitation, or associated with

or employed by others who so solicit, shall be refused recognition to practice before the Patent and Trademark Office or suspended or excluded from further practice.

(b) The use of simple professional letterheads, calling cards, or office signs; simple announcements necessitated by opening an office, change of association, or change of address, distributed to clients and friends, and insertion of professional cards, listings in common form (not display) in a classified telephone or city directory, and listings and professional cards with biographical data in standard professional directories are not prohibited.

(c) No person not an attorney, solicitor or lawyer shall, in any material specified in paragraph (b) of this section or in papers filed in the Patent and Trademark Office represent himself to be an attorney, solicitor or lawyer.]

35. §2.16 is proposed to be revised to read as follows:

§2.16 SUSPENSION OR EXCLUSION FROM PRACTICE

The Commissioner of Patents and Trademarks may, after notice and opportunity for a hearing, suspend or exclude, either generally or in any particular case, from further practice before the Patent and Trademark Office, any person, attorney, or agent shown to be incompetent or disreputable, or guilty of unethical or unprofessional conduct or gross misconduct, or who refuses to comply with the rules and regulations ▶as provided in §§1.349, 1.361 and otherwise in part 1 or this part.◀ [or who shall, with intent to defraud in any manner, deceive, mislead, or threaten any applicant or prospective applicant or other person having immediate or prospective business before the Patent and Trademark Office by word, circular, letter, or in any other manner.] The reasons for any such suspension or exclusion shall be duly recorded. Proceedings for suspension, [disbarment] or exclusion from practice are conducted as provided ▶in §§1.362 - 1.383.◀ [§1.348. (See 35 U.S.C. 1958, sec. 32 for review of the Commissioner's action by the United States District Court for the District of Columbia.)]

Date: JUL 15 ..

Gerald J. Mossinghoff
Commissioner of Patents
and Trademarks

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

SEPTEMBER 20, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,384

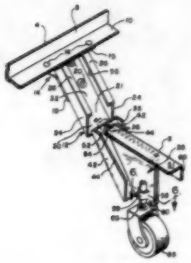
BED FRAME ASSEMBLY

Frank J. Mis, Oaklawn, Ill., assignor to Harris-Hub Company, Inc., Harvey, Ill.

Original No. 4,007,502, dated Feb. 15, 1977, Ser. No. 636,360, Dec. 1, 1975. Application for reissue Dec. 3, 1979, Ser. No. 99,860

Int. Cl.[3] **A47C** *19/02, 21/00*

U.S. Cl. 5—202 **4 Claims**



1. A bed frame adapted to support a spring and mattress assembly comprising a pair of spaced, parallel side-frame member means and at least one cross-frame member means extending between said side-frame member means, *said side frame member means and said cross-frame member means each including a horizontal flange and a vertical flange,* and means releasably securing the ends of said cross-frame member means to said side-frame member means, comprising:

female elements connected to one of said cross-frame and side-frame member means *by a V-shaped bracket, each bracket including a first leg connected in surface abutting engagement with the horizontal flange of said one of said cross-frame and said side-frame member means, each bracket including a second leg extending downwardly and inwardly of said first leg and at an acute angle with respect thereto,* and male elements connected to the other of said side and cross-frame member means, said male-female elements disposed in sliding telescoping engagement with each other and sloping downwardly and inwardly from the lateral sides of the bed frame, said male-female elements defining bed-frame corner supports and being extendable and contractible laterally of said bed frame whereby said side-frame [members] *member means* being movable with the securing [elements] *means* connected thereto are spreadable apart different distances widthwise of the bed frame, and the telescoping male-female elements being cross-wise vertically superposed and mutually supportive to each other and resisting bending moments imposed thereon, *said female elements each including a botton wall and a pair of spaced upstanding side walls respectively extending from opposite edge portions of said bottom wall, each of said side walls having an inwardly extending flange portion spaced from said bottom wall, said bottom and side walls and said flange portions defining a generally channel-shaped passageway for receiving a respective male element, means connecting the bottom wall of each female element in surface abutting engagement with the second leg of one of said V-shaped brackets, and each male element comprisng two plates arranged back to back and secured together, each plate having a generally vertical plate portion, and a bottom section extending outwardly of the bottom edge of the plate portion including an upturned side wall, said bottom sections together forming a bottom wall of the male element, said male elements being slidably receivable in said female elements so that said upturned side walls of each male element are disposed between said bottom wall and flange portions of each female element and adjacent to a side wall of each female element.*

Re. 31,385

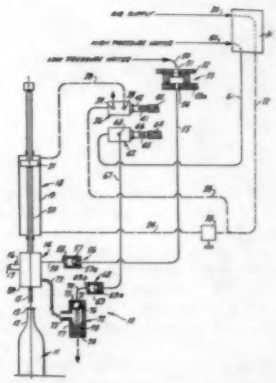
MACHINE FOR TESTING BOTTLES

Dieter K. Schmidt, and Josef J. Buschor, both of Los Gatos, Calif., assignors to New Century Beverage Company, San Francisco, Calif.

Original No. 4,144,742, dated Mar. 20, 1979, Ser. No. 854,240, Nov. 23, 1977. Application for reissue Jun. 30, 1980, Ser. No. 164,051

Int. Cl.[3] **G01M** *3/02*

U.S. Cl. 73—37 **9 Claims**



2. A test apparatus for supplying low pressure and high pressure water to a bottle to be pressure tested at a testing station said apparatus comprising:

(a) a test head movable between a first retracted position separated from a bottle at the test station and a second sealing position in sealing contact with such bottle, said head having a sealing portion

(b) a tube carried by the test head and projecting from the sealing portion thereof to penetrate the bottle when the test head is in its second position, said tube providing a first, central passage for low pressure water into a bottle and forming with the head a second [, annular] passage between the test head and the tube for passage of high pressure water into the bottle,

(c) said head being provided with a first duct for communicating said [annular] *second* passage with a source of high pressure water

(d) said head being also provided with a second duct for communicating said tube with a source of low pressure water

(e) a valve member reciprocable within said head between a first position closing said second duct and a second position opening said second duct and

(f) means normally holding said valve in its first position but acting to move the valve to its second position when the body is in sealing engagement with a bottle.

Re. 31,386

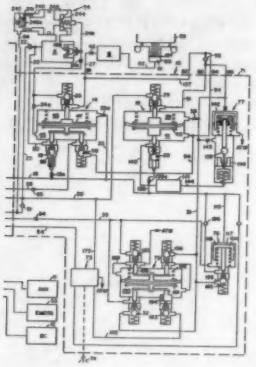
FLUID BRAKE CONTROL SYSTEM

Eugene D. McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Original No. 4,127,308, dated Nov. 28, 1978, Ser. No. 842,761, Oct. 17, 1977. Continuation of Ser. No. 731,618, Oct. 13, 1976, abandoned. Application for reissue Nov. 25, 1980, Ser. No. 210,441

Int. Cl.³ B60T *15/22*

U.S. Cl. 303—35 **95 Claims**



1. A fluid brake control system for governing application and release of brakes of an interchange vehicle having a brake control pipe, [an auxiliary] *a first* fluid reservoir, a fluid brake cylinder, and a brake control device sensing changes in fluid pressure in the brake pipe for at times governing application of fluid to the brake cylinder from [the auxiliary] *said first* reservoir and at other times for releasing fluid from the brake cylinder wherein improvements in the brake control device [comprises] *comprise*;

(a) first and second volume chambers [bath proportionally substantially] *both proportionately* smaller in volume than the respective [auxiliary] *first* reservoir and brake cylinder displacement volumes,

(b) means including the brake control device for charging the first volume chamber from the brake pipe and for preventing fluid flow from the [auxiliary] *first* reservoir to the first volume chamber,

(c) means including the brake control device for charging the second volume chamber from the first volume chamber upon sensing a reduction of pressure in the brake pipe, and

(d) relay valve means sensing a difference in fluid pressure between brake cylinder pressure and pressure in the second volume chamber for governing [flow of fluid from the auxiliary reservoir to] *the degree of braking force applied by* the brake cylinder.

Re. 31,387

ANTI-SKID VEHICLE BRAKING SYSTEM

John P. Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

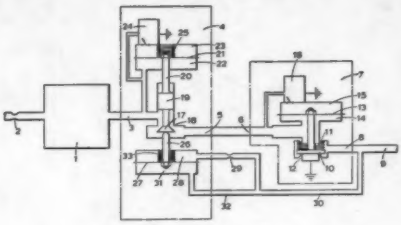
Original No. 4,073,546, dated Feb. 14, 1978, Ser. No. 713,816, Aug. 12, 1976. Application for reissue Feb. 14, 1980, Ser. No. 121,506

Claims priority, application United Kingdom, Aug. 30, 1975, 35854/75; May 11, 1976, 19240/76

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—115 **22 Claims**

12. A fluid-pressure-operated anti-skid braking system for rail and other vehicles comprising at least one actuator for applying a wheel brake, a supply of operating fluid for operating said actuator, fluid flow control valve means interposed between said supply and said brake, fluid from said supply being supplied to said actuator through said valve means, and means responsive to a skid detection signal for operating said valve means to relieve brake skid pressure applied to said actuator when said skid detection signal exceeds a predetermined value to signal a skid condition, said valve means incorporating a fluid-pressure memory chamber for storing a pressure corresponding to said skid pressure, means through which said memory pressure decays during a skid condition by an amount dependent on the duration of said skid condition, said valve means also incorporating a second chamber, said



second chamber containing a pressure corresponding to existing brake pressure, a predetermined relationship between said pressures in said memory chamber and said second chamber determining a changeover point between first and second stages of re-application of fluid from said supply to said actuator, said first stage comprising re-application of said fluid at a rapid rate of pressure increase until an intermediate pressure less than said skid pressure is attained at said changeover point, said second stage comprising continued re-application of said fluid at a reduced rate of pressure increase, and means for restoring pressure in said memory chamber upon re-application of fluid to said actuator.

Re. 31,388

AIR-BAKEABLE WATER-PROOF GETTER DEVICE AND METHOD OF MANUFACTURING

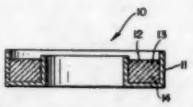
Stephen J. Hellier, and Anselmo G. Passoni, both of Milan, Italy, assignors to SAES Getters, S.p.A., Milan, Italy

Original No. 4,127,361, dated Nov. 28, 1978, Ser. No. 745,982, Nov. 29, 1976. Application for reissue Sep. 24, 1980, Ser. No. 190,392

Claims priority, application Italy, Dec. 12, 1975, 30240 A/75

Int. Cl.³ F04B *37/04;* **H01J** *7/18;* **H01K** *1/56*

U.S. Cl. 417—48 **19 Claims**



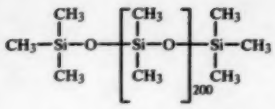
1. A getter device comprising a barium alloy; a metal capable of reacting exothermically admixed with the barium alloy and having an organosilane coating.

9. A getter device of claim 1 comprising:

A. an annular ring;

B. a pulverulent intimate mixture of a barium-aluminium alloy and nickel held by the ring;

C. an organosilane coating covering the entire getter device wherein said coating is an organosilane of Formula II



12. A method of manufacturing an exothermic getter device comprising the steps of pressing a pulverulent mixture comprising a barium-aluminum alloy together with a metal capable of reacting exothermically with the barium-aluminum alloy into a holder, then exposing the pulverulent mixture in the holder to an organosilane, thereby producing a coating.

Re. 31,389

NON-WICKING POLYURETHANE CASTING SYSTEMS

Melvin Brauer, East Brunswick; Barton C. Case, Andover, and Thaddeus F. Kroplinski, Old Bridge, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Original No. 4,224,164, dated Sep. 23, 1980, Ser. No. 953,112, Oct. 20, 1978. Division of Ser. No. 890,212, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 741,275, Nov. 12, 1976, abandoned. Application for reissue Sep. 2, 1981, Ser. No. 298,675

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.3 8 Claims

1. A hollow fiber separatory device capable of use in biomedical applications comprising a hollow fiber bundle consisting of a plurality of fine hollow fibers whose end portions are potted in a tube-sheet and whose open fiber ends terminate in a tube-sheet face, the resulting bundle being sealed within a casing to form a separatory cell having [one] *two* or more fluid ports which allow for the passage of one fluid through the fibers and another around the fibers without mixing of the two fluids, said tube-sheet comprising a cured polyurethane composition comprising the reaction product of (1) a polyol mixture of (a) at least one polyol, and (b) N-N-N'-N'-tetrakis (2-hydroxypropyl) ethylene diamine, and (2) an isocyanate terminated polyurethane based prepolymer, said diamine being present in said polyol mixture in an amount sufficient to cause the viscosity of the urethane system to increase rapidly upon mixing of said polyol containing mixture and said prepolymer to form a gel which turns to a solid upon standing without markedly increasing the initial mix viscosity of the urethane system, thereby permitting placement of said urethane system and substantially reducing wicking of said urethane system after placement, said amount providing a ratio of equivalents of the N-N-N'-N'-tetrakis (2-hydroxypropyl) ethylene diamine to the polyol of from 5:95 to 40:60, and said polyol and said prepolymer being reacted in amounts to provide an NCO-OH equivalent ratio of about 1 to 1.1:1.

Re. 31,390

TREATMENT OF SILICA

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,248,735, dated Feb. 3, 1981, Ser. No. 44,809, Jun. 1, 1979. Continuation-in-part of Ser. No. 857,552, Dec. 5, 1977, abandoned. Application for reissue May 3, 1982, Ser. No. 374,459

Int. Cl.³ B01J *31/02, 31/12, 27/06, 27/20*

U.S. Cl. 252—428 52 Claims

1. A method for producing a catalyst comprising subjecting silica-containing support at an elevated temperature to a heating ambient selected from (1) [carbon monoxide, (2)] a halogen-containing component selected from bromide, iodine, HBr, HI, organic bromides, and organic iodides, which halogen-containing component also either contains air or is followed by air or [(3)] *(2)* a carbon, oxygen and sulfur-containing composition, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

Re. 31,391

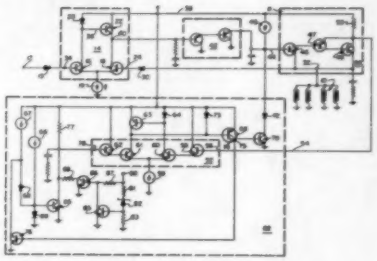
VOLTAGE AND CURRENT REGULATOR WITH AUTOMATIC SWITCHOVER

William F. Davis, Tempe, Ariz.; Ronald W. Russell, Sunnyvale, Calif.; Thomas M. Frederiksen, and Ernest L. Long, both of San Jose, Calif., assignors to Motorola, Inc., Del.

Original No. 3,786,344, dated Jan. 15, 1974, Ser. No. 185,939, Oct. 4, 1971. Application for reissue Jan. 14, 1976, Ser. No. 649,005

Int. Cl.³ F02D *5/00*; H01F *7/18*

U.S. Cl. 361—154 21 Claims



16. An integrated circuit for controlling the supply of current from a power supply to a load, the integrated circuit being adapted to control a power stage, the power stage having a power input terminal for being coupled to the power supply, a control terminal and an output terminal, the output terminal of the power stage being adapted to be connected to the load to supply current thereto, the integrated circuit including in combination:

first and second power supply conductors;

voltage regulator means for controlling the power stage to maintain a substantially constant voltage at the output terminal thereof during a voltage regulation operating mode;

first circuit means for coupling said voltage regulator means to said power stage control terminal, said first circuit means being directly connected between said power stage control terminal and said second power supply conductor;

means adapted to supply a signal representative of the magnitude of the load current;

current regulator means having input, output and control terminals, said control terminal of said current regulator means being connected to said means for applying said signal representative of the magnitude of the load current;

second circuit means coupling said output terminal of said current regulator means to said power stage control terminal for controlling the current supplied by the power stage to the load, said second circuit means being directly connected between said power stage control terminal and said second power supply conductor so that said second circuit means includes a current path in parallel with said first circuit means; and

current source means coupled to said power stage control terminal for energizing said first and second circuit means to enable regulation of the load current and voltage.

PLANT PATENTS

GRANTED SEPTEMBER 20, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,105
ROSE PLANT — MEIDOMONAC VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 20, 1982, Ser. No. 341,103
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant, substantially as illustrated and described, characterized by (a) a free-branching low growing shrub growth habit, (b) abundant formation of very double flowers of Neyron pink coloration, (c) extreme hardiness, (d) exceptional vigor, and (e) good disease resistance, whereby the plant is particularly suited for growing as a landscape planting.

5,106
POTENTILLA FRUTICOSA — BLINK VARIETY

Robert Blair, Dawyck Gardens, Scotland, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 20, 1982, Ser. No. 341,104
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Potentilla fruticosa* substantially as herein shown and described which exhibits (a) attractive pink blossoms which are a truer pink than those of the Royal Flush variety, (b) a more vigorous growth than the Royal Flush variety, and (c) a more upright growth habit than the Royal Flush variety.

5,107
CHRYSANTHEMUM PLANT

Jack M. Meek, deceased, late of Salinas, Calif.; by Saundra J. Meek, executrix, Canyon, Tex., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 7, 1982, Ser. No. 337,724
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the cultivar name of Russet, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, with excellent form retention; anemone capitulum type; light yellow ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform eight week flowering response; medium plant height, and spreading branching pattern.

5,108
CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 18, 1982, Ser. No. 340,107
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., known by the cultivar name of Win, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; orange-bronze ray floret color; diameter across face of capitulum ranging from 80 to 100 mm. at maturity; uniform ten week flowering response; tall plant height when grown single stem; 17 to 24 cm. peduncles on open, normally terminal sprays, and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

PATENTS

GRANTED SEP. 20, 1983

ERRATA

For CLASS	See PATENT NO.
184–001	4,405,035
181–110	4,405,036
494–001	4,405,079
249–097	4,405,083
414–021	4,405,186
548–423	4,405,519
548–423	4,405,520
548–423	4,405,521
424–321	4,405,743
528–266	4,405,771

PATENTS

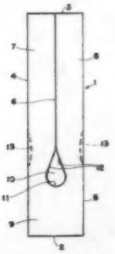
GRANTED SEPTEMBER 20, 1983

GENERAL AND MECHANICAL

4,404,687
CONVERTIBLE OUTERWEAR AND CARRYING BAG
Markus Hager, 701 Avenue K, Brooklyn, N.Y. 11230
Filed Sep. 24, 1982, Ser. No. 438,963
Int. Cl.³ A41D *23/00, 3/02*
U.S. Cl. 2—94 **16 Claims**

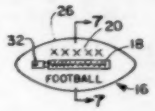
1. A convertible outerwear and carrying bag combination comprising:
an outer garment having interior and exterior surfaces,
a carrying bag pocket attached to the outer garment, and
a garment opening defined in the exterior surface of the outer garment, the carrying bag pocket and the outer garment being disposed in topologically continuous relation such that the carrying bag pocket may be inverted through the garment opening and arranged to receive the outer garment, the carrying bag pocket when inverted through the garment opening providing a carrying bag enclosing a space substantially larger than that required for receiving the outer garment.

4,404,688
COMBINATION SCARF
Phyllis Knight, 505 N. Lake Shore Dr., Chicago, Ill. 60611
Filed Feb. 3, 1982, Ser. No. 345,216
Int. Cl.³ A42B *5/00;* **A42D** *23/00;* **A42B** *1/04*
U.S. Cl. 2—207 **6 Claims**



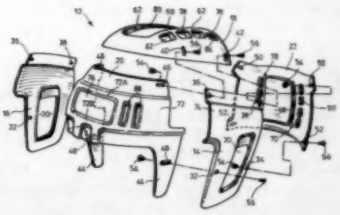
1. A combination scarf as fashionable wearing apparel for the human body comprising an elongated, generally rectangular, one-piece fabric member having:
a proportionately short front panel section at one end of the fabric member which is adapted to cover at least a portion of the breast of said body;
a proportionately long trailing panel section extending to the other end of the fabric member and being separated into two essentially rectangular, longitudinal panel segments with parallel inner facing edges and outer limiting edges which define each panel segment; and
a collar-forming yoke section joining said front panel section with said trailing panel section and containing a teardrop center opening with a substantially circular leading edge adjacent the front panel section and a tapering trailing edge extending from each side of the circular leading edge to join with one of the parallel inner facing edges of said longitudinal panel segments.

4,404,689
FLEXIBLE CONTAINER
Thomas E. DeWan, 1210 E. Oakwood St., Tarpon Springs, Fla. 33589
Continuation-in-part of Ser. No. 175,135, Aug. 4, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,138
Int. Cl.³ A41D *27/20, 3/08, 1/00*
U.S. Cl. 2—247 **15 Claims**



1. A three-dimensional flexible container for an article which is complete and functional apart from the container, comprising:
at least one flexible forming piece encompassing a volume by construction and defining thereby a predetermined shape which is continuous and self-sustaining, and which represents the reproduction of a desired three-dimensional item, the function of which is unassociated with the function of a container;
said flexible container being attached to the article and, upon assuming its predetermined shape, being adaptable to enclose the article.

4,404,690
HOCKEY HELMET
Charles R. Farquharson, Toronto, Canada, assignor to Amer Sport International Inc., Lachine, Canada
Filed Aug. 21, 1981, Ser. No. 295,219
Int. Cl.³ A42B *3/00*
U.S. Cl. 2—420 **26 Claims**



1. A helmet adapted to be placed over a human head, and having a shell and a liner, where said shell comprises:
a pair of side pieces each having respective forward, upper and rear portions, and being adapted to generally accommodate each side, respectively, of a human head;
a top piece being generally downwardly concave and having forward, rear and side portions, each of which has a lower portion; said top piece being adapted to generally accommodate at least the upper portion of the human head;

a front piece being generally rearwardly curved and adapted to generally accommodate at least the forehead portion of a human head; said front piece having an upper portion, and a rear portion at each side thereof;

and a back piece being generally forwardly curved and adapted to generally accommodate the rear portion of a human head; said back piece having an upper portion, and a forward portion at each side thereof;

said front and back pieces being each secured at their respective rear and forward portions to the respective forward and rear portions of each of said pair of side pieces; and

said top piece being secured at least to both side pieces at their respective upper portions.

4,404,691

MODULAR PROSTHESIS ASSEMBLY

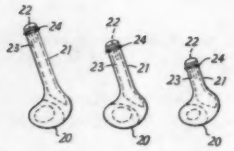
Onno Buning, Clarina, and Peter Lawes, Castletroy, both of Ireland, assignors to Howmedica International Inc., Clare, Ireland

Filed Feb. 25, 1981, Ser. No. 238,013

Claims priority, application United Kingdom, Mar. 11, 1980, 8008140

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.911 **25 Claims**



1. A modular prosthesis assembly for replacement of at least part of a joint and part of the length of a bone shaft comprising a mounting component provided with a connection portion and at least two joint components of similar shape but different dimensions and which can be connected alternatively to said mounting component, each of said joint components having an engagement portion and a connection part adapted for connection to said connection portion of said mounting component, the connection part of said two joint components being of different lengths, said different length connection parts each providing a different length for replacing by itself a part of the length of a natural bone shaft which can be connected to a remaining length of a natural bone shaft or artificial joint, and said mounting component and said at least two joint components thereby co-operating to effect selectively two prostheses of different bone shaft lengths.

4,404,692

CENTERING SYSTEM FOR HIP REPLACEMENT

Nas S. Eftekhar, 25 Paddock Rd., Hohokus, N.J. 07423

Filed Sep. 14, 1981, Ser. No. 301,579

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.912 **18 Claims**

9. An apparatus for centering proximally and distally a hip replacement in the femur of a patient comprising

(A) a trial hip prosthesis for centering proximally the hip replacement comprising

(i) a stem adapted to be fitted in the femur of a patient,

(ii) a ball member,

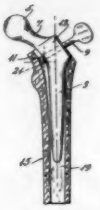
(iii) a neck portion connecting said stem and said ball member, and

(iv) a laterally extending adjusting means disposed in said stem below the neck portion and having one end extending laterally out of the prosthesis below the neck protion to contact and not penetrate the medullary canal to selectively adjust the distance between the trial hip prosthesis and the upper medullary canal so as to center said prosthesis with respect to the upper medullary canal of said femur,

(B) a centering pin adapted to be inserted across said femur to mark the centered position of said trial hip prosthesis, and

(C) a device for centering distally said hip replacement comprising

(i) a cylindrical plug for coaxial insertion into and blockage of the medullary canal in said femur, said plug being provided with a plurality of through bores or openings so oriented to be parallel to the longitudinal axis of the plug, and



(ii) means for accommodating and centering distally the distal end of the stem of said hip replacement, said means comprising a plurality of U-shaped wires each having an open end with two arms and a closed end, each arm of said wires passing through one opening in said plug the closed ends of the U-shaped wires being directed toward the hip replacement and bent, along the plane formed by the arms of said U-shaped wire, away from the stem of said hip replacement to define an expansible and retractable guide to accommodate and center same, the open end of each of said U-shaped wire extending out of the openings in said plug being bent to contact and exert pressure on the medullary canal.

4,404,693

SHANK FOR A HIP JOINT PROSTHESIS

Karl Zweymüller, Vienna, Austria, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 30, 1980, Ser. No. 221,255

Claims priority, application Switzerland, Jan. 14, 1980, 257/80

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.913 **12 Claims**

1. A shank for a hip joint prosthesis, said shank having a blade, a neck and a collar separating said neck from said blade, said blade having a lower portion widening conically on all

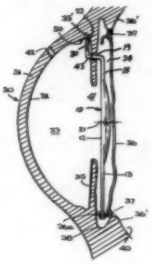
sides from a distal end along a longitudinal median axis to an upper portion at a junction located between ⅓ and ½ of the height of said shank, said upper portion being thinner than said lower portion at said junction and in a plane perpendicular to the plane of the lateral width of said blade, said upper portion extending up to said collar with a median narrow side of said upper portion extending on a steadily curved bend to said collar.

4,404,694

INTRAOCULAR LENS

Charles D. Kelman, 269-70 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Mar. 18, 1982, Ser. No. 359,508
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **14 Claims**



1. An intraocular lens suitable for use as an artificial lens implant, the lens comprising:

a medial, light-focusing, lens body intended to be positioned adjacent the pupil on one side of the iris; and

at least a pair of position fixation elements connected with said lens body;

one of said position fixation elements having a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of said lens body and intended to extend to and seat adjacent the periphery of the iris on said one side thereof;

the other of said position fixation elements having a first portion extending generally laterally outwardly from a second region of the periphery of said lens body spaced from said first region and in a direction generally opposite that of said first portion of said one position fixation element, a second portion extending from said last-mentioned first portion and intended to extend through an opening in the iris from said one side of the iris to the other side of the iris and a third portion connected to said second portion and intended to extend to and seat adjacent the periphery of the iris on said other side thereof.

4,404,695

AUTOMATIC-LOCKING TOILET SEAT LID

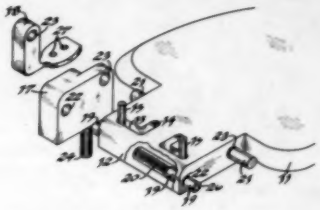
Howard C. Camp, P.O. Box 2072, Huntsville, Ala. 35804

Filed Dec. 14, 1981, Ser. No. 330,682
Int. Cl.³ A47K *13/00, 13/26*
U.S. Cl. 4—253 **5 Claims**

1. An automatic-locking toilet seat assembly comprising:

(a) a toilet seat lid with a centerline and an aft extension unitary with said toilet seat lid, designed to accommodate a first cylindrical hole and a second cylindrical hole said holes running transverse to the lid centerline, and parallel to each other, wherein said first cylindrical hole is forward of said second cylindrical hole and accommodates an axle rod, said second cylindrical hole housing a latch bolt assembly comprised of two sliding latch bolts which are separated by a compression spring and extend outward through opposite ends of said second cylindrical hole said axle being positioned so as to be a pivot about which said latch bolt assembly and said toilet seat lid may rotate;

(b) a pair of anchor bolt lock-block and hinge assemblies; each of said anchor bolt lock-block and hinge assemblies having a pair of indents, said pair of indents being comprised of a forward indent and a rear indent, said forward indents being positioned to receive and hold said axle rod at its ends, said rear indents being simultaneously positioned to receive the extended portions of said sliding



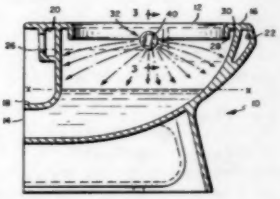
latch bolts when said toilet seat lid is in a down position, said sliding latch bolts being controlled by a pair of studs which extend out through a pair of L-shaped slots in said aft extension of said toilet seat lid, said L-shaped slots allowing said studs to be hooked back into a position where said sliding latch bolts are removed from said rear indents permitting said toilet seat lid to rotate freely, said studs and said sliding latch bolts being operable in an automatic locking mode when said studs are not hooked.

4,404,696

FLUID VELOCITY ASSIST

Walter O. Heinze, Green Valley, Ariz.; Wesley M. Tufts, Holliston, and Jeffrey F. White, Avon, both of Mass., assignors to International Water Saving Systems, Inc., New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,224
Int. Cl.³ E03D *9/06, 11/06*
U.S. Cl. 4—420 **2 Claims**



1. In combination; a toilet bowl having a concave interior surface terminating in a bottom opening structured to be connected by a trap to a soil pipe so that water stands at a predetermined level in the bowl above the bottom opening, a rim at the top of the bowl defining a closed passage peripherally thereof, said closed passage being provided with an opening at the rear of the bowl for connection to a source of water under pressure, means defining a skirt inwardly of the rim forming a downwardly-open, continuous slot peripherally of the rim, said passage having at its inner side two or more openings in communication with the interior of the bowl at approximately the level of the lower edge of the skirt, said lower edge of the skirt having an upwardly-concave recess concentric with said openings and a jet member fitted into each opening comprising a cylindrical head corresponding in axial length to substantially the distance from the inside surface of the rim to the inside

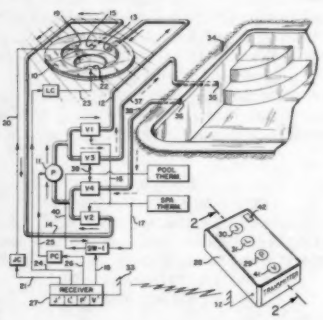
surface of the skirt and of a radius such as to fit snugly into the recess in the skirt and a stem portion of yieldable material dimensioned to be forced to fit snugly into said openings and said stem portion having an axial passage of circular cross section extending from the outer end of said stem into the head and said head having a downwardly-open slot, the top of which is horizontally tangent to said passage at the top of the passage in the head portion, said slot cooperating with said passage and defining a surface opposite the outer end of said passage, the plane of which intersects the curved surface of the bowl above the water line.

4,404,697

REMOTE CONTROL SYSTEM FOR SPAS

Frank L. Hatcher, Ventura, Calif., assignor to Intermatic Incorporated, Spring Grove, Ill.

Filed Aug. 14, 1978, Ser. No. 933,462
Int. Cl.³ E04H *3/18*
U.S. Cl. 4—492 **3 Claims**



1. A remote control system for spas wherein the spa has a water recirculating pump for passing water into a spa water inlet in the spa and receiving water from a spa water outlet and wherein the spa further includes a water jet generating blower and a light, said control system including in combination:

(a) pump control means responsive to a pump signal to turn said pump on and off;

(b) a radio signal receiver responsive to a transmitted signal for providing said pump signal;

(c) a jet control means responsive to a jet signal for turning said water jet generating blower on and off, said radio signal receiver being responsive to a different transmitted signal for providing said jet signal;

(d) a light control means responsive to a light signal to turn said light on and off, said radio signal receiver being responsive to a still different transmitted signal for providing said light signal; and,

(e) a hand-held battery powered radio signal transmitter having manually operable means for transmitting said transmitted signal, manually operable means for transmitting said different transmitted signal and manually operable means for transmitting said still different transmitted signal, said transmitter being encased in a watertight housing and having a specific gravity less than 1.0 so that it will float

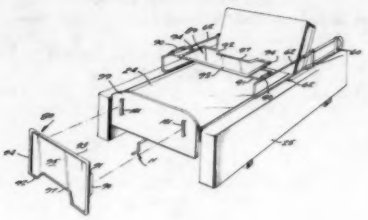
whereby water in the spa can be recirculated, the said water jet generating blower turned on and off and the light turned on and off by a person holding and operating said transmitter from a remote location as well as when sitting in said spa.

4,404,698

OVERBED TRAY ARRANGEMENT

Joseph A. Koncelik, Worthington; David B. Chaney, Powell, both of Ohio; Walter G. Lockard, Quakertown, Pa.; Kevin J. Reeder, Columbus, Ohio, and Thomas D. Hontz, Quakertown, Pa., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 18, 1980, Ser. No. 188,473
Int. Cl.³ A47B *23/02*
U.S. Cl. 5—507 **20 Claims**



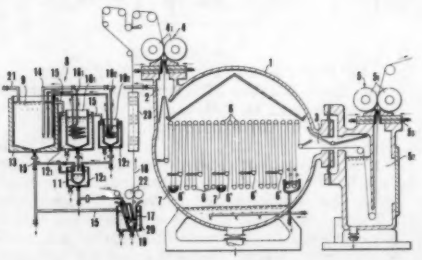
1. A tray assembly comprising: a body including a head portion, a foot portion, a pair of parallel side portions, and a substantially flat support surface that gently slopes downwardly from said head portion to said foot portion; a vertical lip provided upstanding from the support surface at said foot portion and at least portions of said side portions adjacent said foot portion; and means for mounting said body on a pair of generally parallel horizontally spaced supports so that an individual utilizing said tray can eat off of or write on said tray support surface generally horizontal although gently sloping downwardly from said head portion to said foot portion; said tray body being formed from two separate portions, a top portion and a bottom portion having corresponding circumferential definitions so that they fixedly fit together to form the body, and said top and bottom portions comprising injection molded plastic portions fixedly fitted together and defining a space therebetween.

4,404,699

METHOD OF CONTINUOUSLY WET HEAT TREATING A CLOTH AT AN ELEVATED TEMPERATURE

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Aug. 19, 1981, Ser. No. 294,389
Claims priority, application Japan, Sep. 16, 1980, 55-128397
Int. Cl.³ D06B *3/12, 23/00*
U.S. Cl. 8—149.1 **3 Claims**



1. A method of continuously treating a cloth comprising wet heat treating the cloth at an elevated pressure in a high pressure steamer containing a high temperature and pressure steam with the high pressure steamer comprising a steamer body

with a seal mechanism, heating a treating solution in a treating solution application tank provided outside the steamer body by using steam exhausted out of the seal mechanism of the steamer body, soaking the cloth prior to being treated in the steamer up to the core part thereof with thus heated treating solution, and drying the cloth soaked with the treating solution by evaporating water therefrom prior to the cloth being treated in the steamer.

4,404,700

MACHINE FOR LASTING SIDE PORTIONS OF SHOES

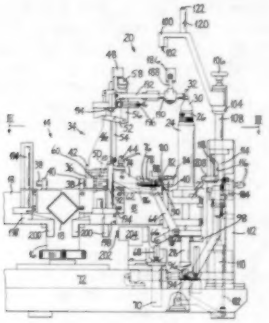
William H. Berrill, and Frank C. Price, both of Leicester, England, assignors to USM Corporation, Farmington, Conn.

Filed Jan. 25, 1982, Ser. No. 342,713

Claims priority, application United Kingdom, Jan. 26, 1981, 8102296

Int. Cl.³ A43D *21/00, 89/00, 3/00*

U.S. Cl. 12—12 **14 Claims**



1. A machine for lasting side portions of shoes comprising a shoe support for supporting, bottom uppermost, a shoe comprising an upper mounted on a last and an insole on the bottom thereof, two side lasting assemblies, arranged one at either side of the last support, and two adhesive-applying nozzles mounted on a carriage for movement relative to the last support whereby adhesive can be applied thereby progressively along opposite side portions of the shoe bottom prior to operation of the side lasting assemblies thereon;

said shoe support comprises a heel support, toe end support means, including a toe end engaging member, movable towards the heel support to bring the toe end engaging member into an operative position, in which it is in engagement with the toe end of a shoe placed on the heel support, and abutment means including an abutment member which is operatively connected with the toe end engaging member and positioned according to the operative position thereof; and

a sensing member mounted on said carriage, for sliding movement relative thereto, and which is resiliently urged into a projecting condition thereon, the arrangement being such that, as the carriage is advanced towards the last support, with the sensing member in its projecting condition, said member engages the abutment member and its movement is arrested thereby, said member thus being held against further movement during the remainder of the advancing movement of the carriage, and further wherein the advancing movement of the carriage is terminated and reversed by valve means actuated by actuator means therefor during such advancing movement, the arrangement being such that said valve means and actuator means are mounted one on the sensing member and the other for movement with the carriage.

4,404,701

SHOE SUPPORT

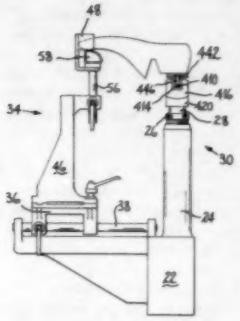
Frank Hartshorn, Wigston; Brian J. M. Murphy, Leicester, and Richard E. Storer, Syston, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Jan. 22, 1982, Ser. No. 341,531

Claims priority, application United Kingdom, Feb. 20, 1981, 8105496

Int. Cl.³ A43D *3/00*

U.S. Cl. 12—127 **7 Claims**



1. A shoe support for supporting a shoe comprising an upper and an insole carried on a last, said support comprising:

a toe support means and a heel support means, the relative positions of said toe support means and heel support means being settable, according to the size and style of shoe, in directions extending both lengthwise and widthwise of the shoe bottom, wherein the heel support means comprises a last pin on which a last with an upper and insole carried thereon can be supported, bottom uppermost, and which is mounted on a support member for limited rocking movement about an axis extending lengthwise of the shoe bottom, the support member being itself mounted for movement about an axis extending heightwise of the shoe bottom whereby the support member can be positioned with the rocking axis of the last pin substantially in the heel-to-toe plane of the shoe supported by the shoe support.

4,404,702

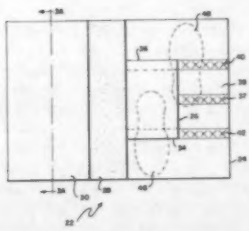
SHANKED INNERSOLE CONSTRUCTION

John M. Clayman, Salem, and Norman Weiner, Lexington, both of Mass., assignors to P. Clayman & Sons, Inc., Salem, Mass.

Filed Mar. 2, 1981, Ser. No. 239,345

Int. Cl.³ A43B *13/41*; **A43D** *31/00*

U.S. Cl. 12—146 S **1 Claim**



1. A method for fabricating a shanked innersole comprising the steps of:

providing a sheet of street side layer material of sufficient

length and width that a plurality of innersole blanks may be cut therefrom;

lapping said sheet of street side layer material with a sheet of tuck material narrower in at least one dimension than said sheet of street side layer material, said tuck material sheet being skived along at least one edge;

laminating said street side layer material and said tuck material together by application of adhesive therebetween;

lapping the tuck layer side of said laminate with at least one sheet of sponge material;

cutting through said sponge material and said laminate with dies to form a plurality of innersole blanks in a pattern such that a toe portion of each blank contains no tuck material while a heel portion of each blank includes tuck material, with a skived edge of said tuck material being disposed intermediate said toe and heel portions;

separating tuck material layer and said street side material layer at the heel of each blank;

inserting therebetween a metallic shank stiffening strip having a perforation adjacent each of its ends;

fastening a rivet through said street side material and through of each of said perforations;

cementing said tuck material layer and said street side material layer together again; and

molding said innersole blank to conform to the shape of said metallic shank stiffener and the desired shoe contour.

4,404,703

PAINT ROLLER

Leigh C. Woodall, Jr., Roxboro; John T. Hayes, Durham, and Robert G. Currier, Roxboro, all of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,710
Int. Cl.³ B05C *17/02;* B05D *5/02*
U.S. Cl. 15—230.11 **18 Claims**

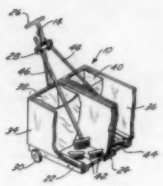
1. A paint roller particularly suited for texture painting and comprising a cylindrical core and a pile fabric covering secured to the cylindrical core, said pile fabric covering comprising a backing fabric and pile yarns interengaged with said backing fabric and extending from one face thereof to form a pile comprised of a multiplicity of upright open pile loops, the density of the pile loops and the size of the pile yarns forming the loops being such as to render substantially the totality of each loop readily visible and to provide substantial void volume within the pile of the fabric for receiving and holding paint therein, said pile yarns having such flexural properties that the pile loops normally extend in a self-supporting, upright orientation from the backing fabric and are resiliently urged to such upright orientation upon the removal of pressure applied to the surface of the pile fabric, and wherein the flexural properties of the pile loops permit readily moving the pile loops from the upright orientation toward the flattened position upon pressure being applied to the pile surface during painting and thereby facilitating release of paint from within the pile.

4,404,704

CLEANING KIT

Philipp Rabban, P.O. Box 401, Hollywood, Fla. 33022

Filed Nov. 30, 1981, Ser. No. 325,694
Int. Cl.³ A47L *13/51*
U.S. Cl. 15—257 R **3 Claims**



1. A cleaning cart comprising:

a base frame having side portions and at least two wheels connected at one side of the bottom of the base frame and a plurality of floor engaging projections situated at the other side of the bottom of the base frame;

a handle connected to the base frame at the wheel side, said handle having a retaining member adapted to receive and retain at least two handles for preliminary and finishing cleaning devices; and

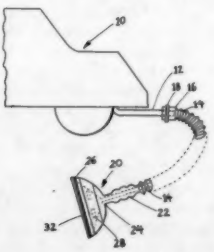
at least two containers situated on the base frame, each said container including three lower margins recessed inwardly from three respective outer walls to form respective step portions and a fourth lower margin flush with the respective fourth outer wall, said walls having flush lower margins of two respective containers facing each other, the walls with the depressed lower margins being located outside the side portions of the frame, the bottoms of the containers being located within the side portions of the frame, one container receiving therein a plurality of preliminary cleaning appliances to be removably attached to said preliminary cleaning device and another container receiving therein a plurality of finishing cleaning appliances to be removably attached to said finishing cleaning device.

4,404,705

CAR WINDOW DEFROSTER

Klaus D. Thoma, Twelve Greenway Plaza, Suite 1200, Houston, Tex. 77046

Filed Apr. 3, 1981, Ser. No. 250,610
Int. Cl.³ A47L *5/14*
U.S. Cl. 15—313 **4 Claims**



1. A hand-held scraping device for de-icing frozen car windows utilizing the exhaust fumes emitted through the car's tail pipe for softening or melting the layer of ice, comprising:

hose means for conducting said exhaust fumes from said tail pipe to said window;

connecting means for removably and sealingly clamping one end of said hose means to said tail pipe;

scraping means connected to the other end of said hose means for distributing said exhaust fumes onto said window and for removing the softened-up layer of ice from said window, said scraping means including a handle portion and a broad and flattened head portion; and

exhaust fume outlet means through said flattened head portion for directing said fumes onto the ice covering said window, said exhaust fume outlet means including a continuous narrow, generally rectangular outlet strip between the bottom and front walls of said flattened head portion and one or more openings in the bottom wall of said flattened head portion.

4,404,706

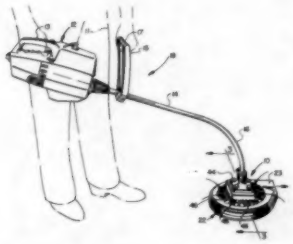
PORTABLE AIR BLOWER SWEEPER APPARATUS

Ronald C. Loyd, Keithville, La., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 7, 1981, Ser. No. 309,433

Int. Cl.³ A47L *5/14*

U.S. Cl. 15—344 **16 Claims**



1. An air blower for attachment to a portable power supply unit including a prime mover, a support, and a drive shaft mounted on said support, said air blower comprising:

a casing including first and second separable parts, a generally upward facing air inlet opening formed in a top wall of said first part of said casing, a bottom wall formed on said second part of said casing spaced from said top wall and defining an air flow passage between said walls, and a generally horizontal air discharge nozzle in said casing in communication with said passage for directing a relatively high velocity air stream away from said casing;

a mounting surface formed on said casing for removably mounting said casing on said support;

an impeller disposed within said casing, said impeller having a hub including means for removably mounting said impeller on said drive shaft in driven engagement with said drive shaft; and

means on said impeller for connecting said impeller to said drive shaft and removing said impeller from said drive shaft without disassembling said casing.

4,404,707

CASTORS

Philip S. Walker, Slough, England, assignor to Flexello Casters & Wheels Limited, Berkshire, England

Filed May 20, 1981, Ser. No. 266,589

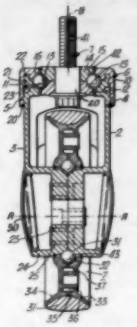
Claims priority, application United Kingdom, May 6, 1980, 8014993

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—31 R **5 Claims**

1. A swivelling wheeled castor, comprising two similar fork halves, each of said fork halves comprising a leg, said fork halves having means for detachable interengagement with one another, and together defining:

(a) part of a circular horizontal track for bearing balls at the upper part of the castor from which the fork legs depend, these bearings supporting a stem for relative swivelling movement about a vertical castoring axis; and



(b) part of a circular vertical track for bearing balls on a circumference around the rolling axis, an outer wheel part being mounted for the rolling movement on these bearings.

4,404,708

HANDLE

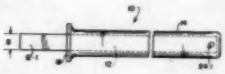
Albert J. Winter, Vereeniging, South Africa, assignor to Modern Inventions (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 59,232, Jul. 20, 1979. This application May 3, 1982, Ser. No. 374,422

Claims priority, application South Africa, Aug. 7, 1978, 78/4458

Int. Cl.³ A47B *95/02*; A47I *45/00*; B65D *25/28*; E05B *1/00*

U.S. Cl. 16—110 R **18 Claims**



1. A handle of the kind described, which comprises an elongate body of elastomeric material, the body having opposite ends beyond which the elastomeric material does not extend, and a reinforcing core embedded in and extending substantially throughout the length of the body, the core having a pair of end portions protruding beyond one of said ends of the body for inserting into the passage of a striking head, the end portions being capable of being wedged apart so as to facilitate fastening of the handle to the striking head.

4,404,709

FASTENING DEVICE FOR HANDLES, ARMS RESTS ETC. ON THE WALL OF A VEHICLE, OR THE LIKE

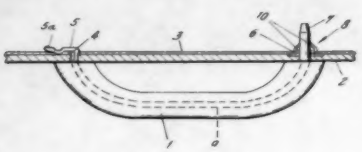
Joachim Janz, and Ulrich Svejkovsky, both of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,246

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021552

Int. Cl.³ A47B *95/02*

U.S. Cl. 16—111 R 13 Claims



1. A fastening device for attaching a part to a wall, comprising:

a first and a second receptacle for use in a wall for defining first and second connection points, respectively, for the part;

a guide pin attached at one location on the part for being inserted into the first receptacle and the guide pin is oriented on the part so that, upon insertion of the guide pin into the first receptacle, the guide pin is oriented to extend generally along the plane of the wall in which the first receptacle is positioned;

a locking pin attached at a second location on the part for being inserted into the second receptacle and the locking pin is oriented on the part so that, upon insertion of the locking pin into the second receptacle, the locking pin is oriented to extend generally into the wall in which the second receptacle is positioned;

a pull out safety for blocking withdrawal of the locking pin from the second receptacle, wherein the pull out safety comprises two spring legs normally biased to squeeze against the locking pin, and the spring legs are oriented to converge against the locking pin in a direction of insertion of the locking pin, whereby the spring legs block extraction of the locking pin from the second receptacle; and wherein the second receptacle comprises a U-shaped clamp, including the two spring legs of the pull out safety as the legs of the U, and the web of the U having an oblong hole defined therein extending along the length of the space between the spring legs and through which the locking pin is passed for enabling the locking pin, which has passed through the hole, to be moved laterally of the length of the locking pin, and the spring legs being of such length toward the locking pin that at one position along the length of the oblong hole, the spring legs do not squeeze the locking pin.

4,404,710

APPARATUS FOR FEEDING FIBERS TO CARDING MACHINES AND THE LIKE

Dennis E. Wood, Fairport, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Filed May 29, 1981, Ser. No. 268,326

Int. Cl.³ D01G *15/40, 23/08*

U.S. Cl. 19—105 14 Claims

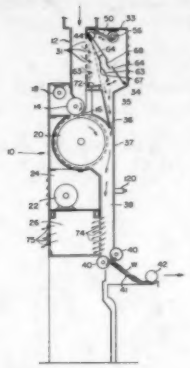
1. In a system for pneumatically feeding airborne fibers to a feed chute having intermediate its ends at least one feed roll for feeding fibers from a supply thereof adjacent one end of the chute to a formation section adjacent the opposite end of the chute, apparatus for controlling the density of the column of fibers formed in the formation section of the chute, comprising

means for sensing the existing air pressure differential between opposite ends of said formation section,

means for generating a first electrical signal the voltage of which varys in proportion to changes in the pressure differential detected by said sensing means,

means for generating a second electric signal having a set voltage which is proportional to the desired pressure differential in said formation section,

first feed roll control means responsive to said first signal to increase the rate of rotation of said feed roll as said pressure differential decreases, and vice versa,



second feed roll control means for interrupting the operation of said feed roll when the voltage of said first signal exceeds one of two predetermined limits above and below, respectively, the voltage of said second signal,

pump means for intermittently supplying pulses of compressed air to one end of said formation section of said chute to compact the column of fibers therein, and

first control means for said pump means responsive to said first signal to increase the rate at which said pulses are supplied to said formation section as said pressure differential decreases, and vice versa.

4,404,711

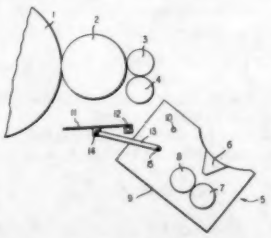
APPARATUS FOR WITHDRAWING AND GATHERING A FIBER WEB

Jürgen Klüttermann, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 294,003

Int. Cl.³ D01G *15/46*

U.S. Cl. 19—106 R 6 Claims



1. In a carding machine including a doffer, a web delivering assembly cooperating with the doffer, a calender unit arranged for receiving a fiber web discharged by the web delivering

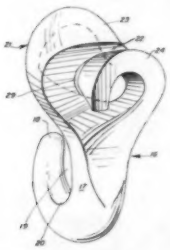
assembly; said calender unit including a sliver trumpet receiving the fiber web from said web delivering assembly and calender rolls receiving a sliver from said sliver trumpet; said calender unit being displaceably supported for assuming an operative position in which said sliver trumpet is situated in the immediate vicinity of said web delivering assembly and an inoperative position in which said sliver trumpet is remote from said web delivering assembly; and a start-up tray supported underneath said doffer and said web delivering assembly; the improvement comprising mounting means for movably supporting said start-up tray for assuming a start-up position in which, during start-up run, said start-up tray guides leading portions of the fiber web from said doffer to said web delivering assembly and a withdrawn position in which said start-up tray leaves the space underneath said doffer and said web delivering assembly substantially unobstructed; and coupling means connecting said start-up tray with said calender unit for moving said start-up tray by said calender unit into said start-up position when said calender unit moves into its inoperative position and for moving said start-up tray by said calender unit into said withdrawn position when said calender unit moves into its operative position.

4,404,712

SLING HOOK

Melvin M. Northe, and Dean W. Larson, both of Portland, Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Oct. 28, 1981, Ser. No. 315,725
Int. Cl.³ F16G *11/00*
U.S. Cl. 24—129 R **9 Claims**



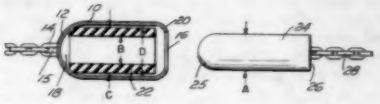
1. A sling hook comprising a unitary body having a shank curving downwardly and forwardly into a bill with the upper end of said bill being in spaced relation to said shank to provide a throat adapted to receive a wire rope therein, said throat being downwardly arcuate to provide a nadir for the bottom of said wire rope, said body at the upper end being equipped with an integral sleeve portion adapted to receive a wire rope sling and providing a downwardly facing elongated bearing surface therefor, said sleeve portion being equipped with a generally curved slot dividing the same into oppositely extending forward and rear lug eyes and interrupting said bearing surface, said slot accommodating receipt of said sling by twisting the same rather than threading the same into a conventional eye, the rear portion of said forward lug eye being generally aligned with said throat nadir, said forward lug eye having a longer bearing surface than said rear lug eye, each lug eye terminating in a free straight end with said free ends extending downwardly and away from said slot to a point below the center line of a wire rope in said sleeve portion.

4,404,713

CLUTCH USING PARTIAL VACUUM TO RESIST SEPARATION

Edmund Dorsey, 455 Meschanticut Valley Pkwy., Cranston, R.I. 02920

Filed Dec. 7, 1981, Ser. No. 327,887
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—217 R **3 Claims**



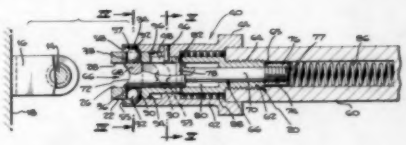
1. A clutch comprising a tubular shell closed at one end to define an open cavity, a resilient, stretchable, tubular clutch member having a through bore and an outer transverse dimension smaller than the inner transverse dimension of the cavity loosely retained in the cavity, a stud of a transverse dimension larger than the inner transverse dimension of the clutch member and adapted to be inserted and withdrawn from the clutch member with the external and internal surfaces, respectively, of said stud and clutch member in sealing relation to each other, whereby the resilient clutch member expands in said shell during insertion of said stud, yet allows release of displaced air from said shell, said shell having peripheral lip means at the open end of the cavity and being imperforate except for said open end whereby, as the stud is withdrawn, the clutch member seals against the lip means and a partial vacuum occurs thereby resisting disengagement.

4,404,714

COUPLING MECHANISM

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Dec. 17, 1979, Ser. No. 104,167
Int. Cl.³ A44B *11/25, 17/00*
U.S. Cl. 24—230 AL **3 Claims**



1. A coupling mechanism adapted for transverse coupling to a keeper pin which comprises:

a housing having a slotted front portion adapted to transversely receive a keeper pin, said slot extending coaxially with the longitudinal axis of said housing;

detent means associated with said housing for releasably coupling a keeper pin and movable between coupled and uncoupled positions;

a slidable keeper pin receiving member mounted in said housing having a forward end engagable by a keeper pin and keeper pin biasing means associated therewith for normally biasing said member in a direction whereby said detent means abuts against said keeper pin receiving member, thereby retaining said detent means in said uncoupled position until said keeper pin receiving member is moved against its bias to thereby release said detent means permitting said detent means to move to its coupled position, said keeper pin receiving member having a plug attached to its end remote from said forward end and said plug being adapted to abut against the end of said housing remote from said slotted front portion when said keeper pin receiving member is mounted in said housing;

sleeve means slidably associated with said housing for releasably locking said detent means in said coupled position and movable between a position locking said detent means in said coupled position and a position allowing movement of said detent means to said uncoupled position, said sleeve means being slotted to transversely receive a keeper pin, said sleeve means slot extending coaxially with the longitudinal axis of said housing, said sleeve means further including a detent body contact surface displaced sufficiently from said housing to permit movement of said detent bodies into said uncoupled position when said sleeve means is in said detent movement allowing position and a locking portion having a locking surface rearward of said front portion, said locking surface retaining said detent bodies in said coupled position when said sleeve means is in said detent locking position; and

biasing means for biasing said detent bodies to said coupled position and said sleeve means to said detent locking position including an inwardly sloping biasing surface which connects said front portion detent body contact surface with said locking surface whereby forward slidable movement of said biasing surface when said biasing surface is in contact with said detend bodies causes inward movement of said detent bodies toward said coupled position and a spring for urging said biasing surface in said forward direction.

4,404,715

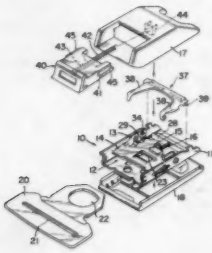
SAFETY-BELT BUCKLE OF SLIDE-UNLOCKING TYPE

Mutsumi Sugimoto, Hamamatsu, Japan, assignor to Katsuyama Kinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 24, 1982, Ser. No. 391,743

Int. Cl.³ A44B *11/00, 11/06*

U.S. Cl. 24—230 A **6 Claims**



1. A safety-belt buckle characterized in that it comprises:

a tongue (**20**) adapted (**21**) to be secured at a rear part thereof to a free end of one belt strap and having a locking opening (**22**) at a front part thereof;

a base plate (**11**) adapted (**35**) to be secured at a rear part thereof to a free end of another belt strap;

a latch device (**12**) mounted on the base plate and having a latch plate (**14**) formed to have a locking catch (**23**) capable of positively catching and thereby locking the forward edge of the locking opening of the tongue when the front part of the tongue is slidingly inserted into the latch device between the latch plate and the base plate through an insertion slot (**19**) at the front end of the base plate;

a link plate (**13**) which is rockably supported on trunnions (**31, 31**) journaled in side flanges (**24***a*, **24***b*) of the base plate, and which has engagement slots (**33, 33**) disposed forward of the trunnions and adapted to engage the rear edge of the latch plate, engagement lugs (**34, 34**) disposed rearward of the trunnions, and spring parts (**29, 29**) for pressing the latch plate toward the base plate;

an actuating plate (**37**) elastically and pivotally supported on the side flanges of the base plate and having forwardly projecting arms (**38, 38**), intermediate parts of which are engaged with the engagement lugs of the link plate;

a casing cover (**17**) mounted on the base plate and functioning cooperatively therewith to protectively cover and accommodate the above enumerated parts; and

a slide button (**40**) which is partly accommodated within the casing cover and so supported thereby as to be slidable in the front-rear directions of the base plate and is continually biased forward by spring force (**42**), and which has inclined surfaces (**41, 41**) engageable with the free front ends of the projecting arms of the actuating plate,

the tongue in locked state being unlocked by pressing the slide button rearward against the spring force, whereby the inclined surfaces thereof press the actuating plate toward the base plate thereby to cause the link plate to move the rear edge of the latch plate away from the base plate, and the locking catch is thereby disengaged from the front edge of the locking opening of the tongue, which is thereby released.

4,404,716

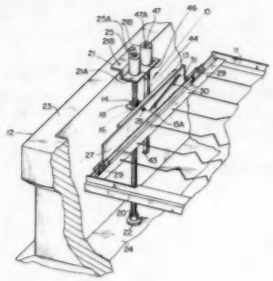
COFFIN BED ADJUSTING APPARATUS

Robert K. Foust, 301 May Kay La., Connersville, Ind. 47331

Filed Aug. 8, 1982, Ser. No. 405,993

Int. Cl.³ A61G *17/00*

U.S. Cl. 27—12 **8 Claims**



1. An apparatus for elevating and tilting a bed in a burial casket, said apparatus comprising:

(a) an elevating support member;

(b) elevation adjustment means for adjusting the vertical height of said elevating support member;

(c) a bed support member pivotally mounted to said elevating support member at a pivoting point, said bed support member including an elongated slot which has a first slot end and a second opposite slot end and said first slot end being closer to said pivoting point than said second opposite slot end;

(d) tilting means mounted to said elevating support member, said tilting means including an arm which is slidably received in said elongated slot so that the sliding of the arm causes contact with the walls of the slot resulting in pivoting of the bed support member about its pivoting point.

4,404,717

ENVIRONMENTAL CONTROL OF NEEDLED MAT PRODUCTION

Jeffrey A. Neubauer, Boiling Springs, N.C., and Vincent A. Sarni, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

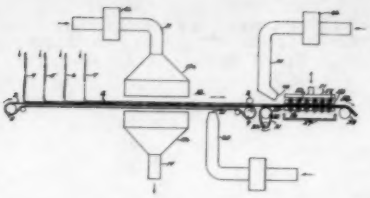
Filed Dec. 11, 1980, Ser. No. 214,832

Int. Cl.³ D04H *3/10*

U.S. Cl. 28—107 **6 Claims**

3. In a method of improving the operation of a needling zone by minimizing process interruption for cleaning wherein continuous strand fiber glass mat is being mechanically bonded by

penetrating the mat with barbed needles to entangle the strands and wherein the mat contains moisture at a level of between 0.5 to 1 percent the improvement comprising introducing air into the zone of needing in sufficient quantities to establish in said



zone an atmosphere which is at a temperature of 50° F. to 120° F. and a relative humidity of between 20 percent and 60 percent to thereby prevent fouling of the needling zone with glass fibers and binder.

4,404,718

APPARATUS FOR MANUFACTURING A BULKY TEXTURED YARN

Koji Tajiri, and Toshiharu Arimatu, both of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 15,904, Feb. 28, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,121

Claims priority, application Japan, Oct. 17, 1977, 52-123584; Mar. 7, 1978, 53-24933

Int. Cl.³ D02G 1/16

U.S. Cl. 28—220 **1 Claim**

1. In an apparatus for manufacturing a bulky textured yarn from a thermoplastic synthetic multifilament yarn, said apparatus being provided with means for texturing said multifilament yarn comprising means (6) for preheating said multifilament yarn and means (15, 8) for treating said preheated yarn with pressurized heated fluid to create bulkiness therein, control means (20) for controlling the temperature of said heated pressurized fluid, means (10) for drafting said textured yarn with a constant rate of draft in a drafting zone downstream of said texturing means (15, 8), the improvement comprising:

a tension detector (31) for detecting the yarn tension in said drafting zone;

a tension setting device (32) for setting a predetermined value of said yarn tension in said drafting zone;

means (33) for detecting deviation between a value of said yarn tension detected by said tension detector (31) and a set value of said tension setting device (32);

said control means (20) controlling temperature conditions which affect thermal shrinkage of said yarn while being processed by said texturing means (15, 8); and

an adjustment device (35) for issuing a control signal corresponding to an output signal of said deviation detecting means (33), an output of said adjusting means (35) being connected to said control means (20),

whereby when said yarn tension detected by said tension detector (31) deviates from said set value thereof, said control means (20) is controlled by the control signal issued from said adjustment device (35), so that the temperature of said heated pressurized fluid of said texturing means (15, 8) is adjusted in accordance with said control signal of said adjusting device (35), and said yarn tension can be maintained at a desired condition corresponding to said set (by 32) value thereof.

4,404,719

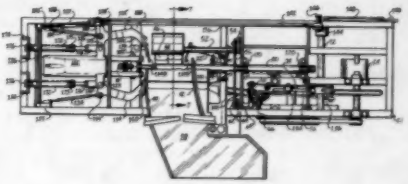
APPARATUS FOR STRIPPING RESIDUAL YARN FROM TEXTILE BOBBINS OR THE LIKE

Kurt W. Niederer, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Division of Ser. No. 900,730, Apr. 27, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,388

Int. Cl.³ B65H 73/00

U.S. Cl. 28—297 **5 Claims**



1. In an apparatus for stripping residual yarn from textile bobbins or the like, said apparatus being of the type having means for engaging a textile bobbin having residual yarn thereon at a delivered position of the bobbin and stripping said residual yarn therefrom including means for supporting and positioning the bobbin in disposition for stripping, an improved means for feeding textile bobbins to said engaging and stripping means comprising

(1) a bobbin supply supporting member supporting thereon a plurality of textile bobbins having residual yarn thereon,

(2) a feed drum having a peripheral slot for receiving and carrying a bobbin therein, disposed for oscillation between a bobbin receiving position wherein said peripheral slot of said feed drum is adjacent said bobbin supply supporting member and a bobbin delivering position wherein said peripheral slot is adjacent said engaging and stripping means at said delivered position,

(3) an operating arm linked to said feed drum in a manner such that reciprocation of said operating arm in a bobbin feeding stroke effects oscillation of said feed drum from said bobbin receiving position to said bobbin delivering position, and

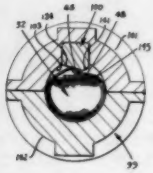
(4) means for reciprocating said operating arm and connected thereto by a pin and slot connection including means for disengaging the operating arm reciprocation of said feed drum when a bobbin is misaligned in said peripheral slot so as to engage said supply supporting member and cause resistance to oscillation thereof by said feed drum, said disengaging means having a drive cam surface in said slot engagable with said pin for driving said operating arm in said bobbin feeding stroke to effect oscillation of said drum, said cam surface being inclined to permit said pin to move in said slot to a position out of engagement with said cam surface when said bobbin is misaligned to resist feed drum oscillation.

4,404,720

APPARATUS FOR FORMING A METALLIC TAPE INTO A TUBE HAVING AN OVERLAPPED SEAM

William D. Bohannon, Jr., Lawrenceville, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 52,165, Jun. 26, 1979, Pat. No. 4,308,662.
This application Nov. 16, 1981, Ser. No. 321,952
Int. Cl.³ H01B 13/24, 13/14
U.S. Cl. 29—33 E 13 Claims



1. An apparatus for forming a metallic tape into a substantially circular tube having an overlapped seam, said apparatus comprising:

means for advancing a metallic tape;

first forming means including a passageway which converges in a direction along which the tape is advanced for causing successive increments of the tape to have a generally circular configuration with longitudinal edge portions of the successive increments being spaced apart; and

second forming means substantially external to an area enclosed by the metallic tape for causing the longitudinal edge portions of the tape to be overlapped and form a substantially closed seam having overlying and underlying edge portions, said second forming means including guideway means for confining the longitudinal edge portions as the tape is advanced to cause the overlying longitudinal edge portion of the tape to be directed inwardly into substantially continuous engagement with the underlying longitudinal edge portion while supporting outer and inner surfaces of the underlying edge portion to prevent its deflection inwardly toward a longitudinal axis of the tube.

3. An apparatus for wrapping a corrugated metallic tape about a cable core to enclose the core in a shield having a substantially circular configuration and having a preformed, overlapped seam, said apparatus comprising:

a tube;

means for advancing a cable core along a path of travel through said tube;

means for advancing a corrugated metallic tape;

means including a generally conically shaped surface which converges in a direction along which the tape is advanced and which is disposed about said tube for causing successive increments of the tape being advanced to have at least a partially curved configuration;

means concentrically disposed about an end portion of said tube to form a plurality of adjacent, sequentially decreasing openings for causing successive increments of the tape advanced therethrough to have a generally circular configuration with longitudinal edge portions of the tape being spaced apart; and

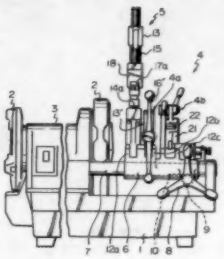
means including guideways which provide individual confinement of longitudinal edge portions of the tape along outer and inner surfaces thereof for at least a portion of the length of the path of travel for forming the longitudinal edge portions of the tape into an overlapped, substantially closed seam having overlying and underlying edge portions with the overlying edge portion being directed inwardly to preclude its protrusion into a plastic jacket which is extruded subsequently over the enclosed core, while supporting the underlying edge portion to prevent its deflection inwardly toward the core as the overlying edge portion is being engaged therewith.

4,404,721

PIPE THREAD CUTTING AND ASSEMBLY MACHINE

Taketomo Ohyama, Mie, Japan, assignor to MCC Corporation, Mie, Japan

Division of Ser. No. 193,105, Oct. 2, 1980. This application Apr. 7, 1982, Ser. No. 366,413
Claims priority, application Japan, Oct. 20, 1979, 54-135705; Oct. 20, 1979, 54-145575[U]; Oct. 20, 1979, 54-145576[U]
Int. Cl.³ B23P 23/04, 19/04; B23G 1/02; B21D 39/04
U.S. Cl. 29—33 T 5 Claims



1. A pipe thread cutting machine comprising:

a machine base having mounted thereon pipe holding chucks and a driving mechanism for rotating a pipe held by said holding chucks;

a reciprocal carriage slidably mounted on said base for selective movement toward and away from said holding chucks;

pipe cutting means mounted on and supported by said carriage for selectively cutting a pipe rotated by said driving mechanism;

thread cutting means mounted on and supported by said carriage for selectively cutting threads into an end of a pipe rotated by said driving mechanism; and

chuck mechanism means mounted on and supported by said carriage for selectively holding a threaded coupling, whereby upon rotation of a pipe by said driving mechanism the coupling is threaded onto a threaded end of the pipe, said chuck mechanism means being pivotally mounted on said carriage for movement between an open withdrawn position and a closed operable position.

4,404,722

APPARATUS FOR FORMING A SPACE SECTION IN A PAIR OF CONTINUOUS SLIDE FASTENER STRINGERS

Hideo Shimai, Namerikawa, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Apr. 29, 1981, Ser. No. 258,566
Claims priority, application Japan, May 1, 1980, 55-58154
Int. Cl.³ B23P 19/04
U.S. Cl. 29—33.2 7 Claims

1. An apparatus for forming a space section devoid of coupling elements in a pair of continuous slide fastener stringers including a pair of tapes carrying along their inner longitudinal edges a pair of rows of interengaged continuous coupling elements attached by stitches to the respective tapes, said apparatus comprising:

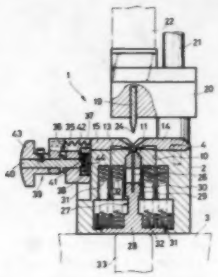
(a) a support table having in its top surface a guide groove for receiving the pair of continuous slide fastener stringers along a longitudinal path;

(b) a stationary die disposed in said support table and having a top surface for supporting the interengaged coupling element rows along a length corresponding to the length of the space section to be formed;

(c) a pair of guide plates disposed one on each side of said guide groove and extending thereover toward each other, said guide plates having an aperture registering with said top surface of said stationary die;

(d) a pressure pad vertically movably disposed around said stationary die in said support table for clamping with said guide plates portions of the tapes around said length of the interengaged coupling element rows supported on said top surface of said stationary die;

(e) a punch vertically movable toward and away from said stationary die and having a sharp cutting edge locatable to project through said aperture of said guide plates into said longitudinal path of the pair of continuous slide fastener stringers for cutting tape-side leg portions of the interengaged coupling elements supported on said top surface of said stationary die;



(f) an ejector extending vertically through said stationary die and aligned vertically with said cutting edge of said punch, said ejector being upwardly movable together with said punch relative to said stationary die for pulling the cut coupling elements out of the stitches while the tapes are clamped between said pressure pad and said guide plates; and

(g) a mechanism for driving said pressure pad and said ejector to be moved in timed relation to each other.

4,404,723

APPARATUS FOR TAKING OFF A BAND WOUND ABOUT A PAPER SHEET BUNDLE

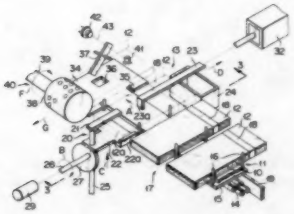
Hiroshi Ohba, Tokyo, and Shigeo Horino, Oizumi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 8, 1981, Ser. No. 261,936

Claims priority, application Japan, May 12, 1980, 55-62414; May 12, 1980, 55-62416

Int. Cl.³ B23D *15/04*

U.S. Cl. 29—33.52 **12 Claims**



3. A band-removing apparatus for taking off a band wound about a paper sheet bundle crosswise of one axis thereof comprising:

transport means for conducting a paper sheet bundle fastened by a band through a transport passage to a band-removing section with the axis of said transported paper sheet bundle set substantially at right angles to a transport direction;

bending means which is provided in the band-removing section to clamp one end portion of the paper sheet bundle and bend said bundle around said one axis, thereby causing part of the wound band to be stretched over the concave portion of the bent paper sheet bundle in the form of a chord;

means for taking off the band from the bent paper sheet bundle by engaging with said part of the wound band to be stretched in the form of a chord; and

discharge means for carrying the paper sheet bundle from which the band has been taken off away from the band-removing section.

4,404,724

HYDROSTATIC SUPPORT ELEMENT, ESPECIALLY FOR A CONTROLLED DEFLECTION ROLL

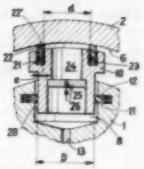
Alfred Christ, and Johann Miesch, both of Zürich, Switzerland, assignors to Escher Wyss Limited, Zürich, Switzerland

Filed Mar. 9, 1981, Ser. No. 242,121

Claims priority, application Switzerland, Mar. 25, 1980, 2320/80

Int. Cl.³ B21B *13/02*; **F16C** *33/74, 32/06*

U.S. Cl. 29—116 AD **10 Claims**



1. A hydrostatic support element, especially for a controlled deflection roll, for supporting a supported part upon a supporting part, comprising:

a plunger member movable at the supporting part in a predetermined displacement direction;

said plunger member coacting with the supporting part for enclosing a hydrostatic pressure chamber to which there is infed a pressurized fluid medium;

said supported part having a running surface;

the pressurized fluid medium acting directly upon the running surface of the supported part;

said plunger member possessing a closure ledge surrounding the pressure chamber;

said closure ledge having a surface coacting with the running surface of the supported part;

said surface comprising a sealing surface of a sealing ledge and measured in the direction of pressure gradient of the pressurized fluid medium having a width which does not exceed 7 mm;

said plunger member possessing a groove;

said sealing ledge being inserted into said groove;

said plunger member having hydraulically effective surface means of a dimension such as to determine the force by means of which the sealing surface of the sealing ledge is pressed against the running surface of the supported part;

the size of the hydraulically effective surface means of the plunger member being chosen such that there is formed a contact force which is just sufficient in order to permit a predetermined low escape of the pressurized fluid medium between the sealing surface of the sealing ledge and the running surface of the supported part; and

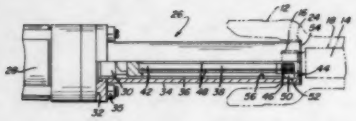
a sealing means between the plunger member and the sealing ledge along an inner surface of the sealing ledge which confronts the pressure chamber.

4,404,725

TOOL FOR INSTALLING AN ELEMENT ON A SHAFT

William C. Sullivan, North East Newark, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 179,412, Aug. 18, 1980, abandoned. This application Aug. 11, 1982, Ser. No. 407,013
Int. Cl.³ B23P 19/04
U.S. Cl. 29—252 3 Claims



1. A tool for installing an element on a shaft said shaft having a threaded end with a plurality of external threads thereon and an enlarged portion adjacent to said theaded end, said element having an opening therethrough which is dimensioned to pass over said threaded end to be positioned on said enlarged portion of said shaft with an interference fit therebetween when said element is fully installed on said shaft, said tool comprising:

a power cylinder having a piston means movably mounted therein:

a tubular ram supported by said power cylinder and extending therefrom, said tubular ram having an end capable of making contact with a surface of said element around said opening;

a gripping member projecting from said piston means of said power cylinder to extend through an interior of said tubular ram, said piston means being capable of moving an extended end of said gripping member into and outwardly of said interior of said tubular ram;

said extended end of said gripping member being circumferentially divided into sections by axially extending slots therethrough, said sections of said extended end having internally threaded portions having a plurality of internal threads which match said plurality of said external threads of said threaded end of said shaft when said extended end is fully within said interior of said tubular ram, said sections being performed to be separated one from the other to allow said internally threaded portions to freely pass over said threaded end of said shaft when said extended end is outwardly of said interior of said tubular ram;

said tubular ram having an interior wall which makes sliding contact with an exterior surface of said extended end of said gripping member to cam said sections thereof inwardly to entrap said threaded end of said shaft in said internally threaded portions when said plurality of said external threads and said plurality of said internal threads are aligned and intermeshed and said extended end is moved into said interior of said tubular ram;

said end of said tubular ram being capable of acting on said surface of said element on said enlarged portion of said shaft as said extended end moves further into said interior of said tubular ram by said piston means; and

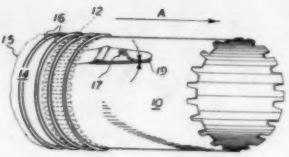
said piston means being incapable of producing said camming of said sections inwardly to entrap said threaded end of said shaft in said internally threaded portion when said plurality of said external threads and said plurality of said internal threads are misaligned and unable to intermesh.

4,404,726

METHOD OF CONNECTING FLEXIBLE TUBULAR DUCT AND A CONNECTOR

Karl Fahrion, 1000 Constance St., Pittsburgh, Pa. 15212

Division of Ser. No. 147,467, May 7, 1980, abandoned. This application Jul. 29, 1981, Ser. No. 287,763
Int. Cl.³ B23P 11/00
U.S. Cl. 29—432.2 2 Claims



1. A method for connecting flexible tubular duct having a scrim supported on a wire helix with a sheet metal tubular connector having piercing members externally and circumferentially connected thereto, said method comprising:

placing one end of the tubular connector in receiving engagement with one end of the flexible tubular duct;

forcing the flexible tubular duct onto said tubular connector by a length such that at least one turn of the helix of the flexible tubular duct passes over the end of the piercing member that is oppositely disposed from the end of the tubular connector; and

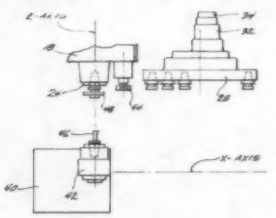
drawing the flexible tubular duct in the opposite direction until the opposite end of the piercing members pierces the scrim of the flexible tubular duct and the wire helix is lodged between the piercing members and the tubular connector.

4,404,727

MACHINE TOOL OPERABLE AS BOTH A CHUCKING TYPE LATHE AND AS A MACHINING CENTER

Frank Zankl, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 24, 1981, Ser. No. 237,750
Int. Cl.³ B23Q 3/157
U.S. Cl. 29—568 9 Claims



1. An improved machine tool operative as both a chucking type lathe and a horizontal spindle machining center comprising:

a frame;

a spindlehead; means slidably mounting said spindlehead on said frame for vertical and horizontal movement thereon;

a tool and workpiece carrying spindle rotatably journaled in said spindlehead parallel to the path of horizontal movement of said spindlehead, said spindle having means to receive a workpiece or a cutting tool thereon;

means connected to said spindle for rotatably driving said spindle to rotate the workpiece holder or toolholder in said spindle;

tool and workpiece holding means slidably mounted on said

frame for horizontal movement on said frame perpendicular to the path of horizontal movement of said spindlehead on said frame, said tool and workpiece holding means being rotatable about an axis parallel to the vertical path of spindlehead movement for positioning a workpiece or a tool held therein in a predetermined relationship with said spindle;

storage means mounted to said bed for storing workpiece holders and toolholders, means connected for rotating said storage means about an axis parallel to the axis of spindle rotation for positioning a workpiece holder or toolholder in a ready position adjacent to said spindle; and

a changer arm journaled to said spindlehead for rotational movement about, and longitudinal movement along, an axis parallel to said spindle axis for transferring workpieces and tools between said spindle and said storage means and for transferring workpieces and tools between said spindle and said tool and workpiece holding means.

4,404,728

TOOL POT CLEANING SYSTEM FOR TOOL MAGAZINE

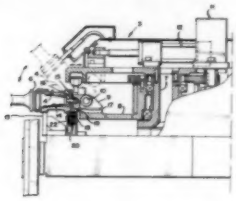
Kazutomi Ishikawa, Okayama, Japan, assignor to Mori Machinery Co., Ltd., Okayama, Japan

Filed Apr. 24, 1981, Ser. No. 257,410

Claims priority, application Japan, Apr. 26, 1980, 55-57902[U]

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **3 Claims**



1. A tool pot cleaner of a tool magazine which is on a cradle provided with a number of tool pots, attachment means for pivotally mounting a tool pot to said cradle, the tool pots being disposed movably and radially with an elevation angle of the outer circumference of said tool magazine, said tool pot cleaner comprising:

an air passage provided at the base of each tool pot; and

an air supply means having an air connection port provided in the tool cradle for supplying air to said air passage via said air connection port when said tool pot is tilted for tool exchange;

whereby when the tool pot is tilted for tool exchange, the air passage is opened through to said air connection port to thereby let the air jet into the tool pot to clean the inside of the tool pot.

4,404,729

MULTI-SPINDLE MACHINE TOOLS

Niels D. Jensen, Bjerringbro, Denmark, and Arne Johansen, Fahrenkrug, Fed. Rep. of Germany, assignors to Grundfos Pumpenfabrik GmbH, Wahlstedt, Fed. Rep. of Germany

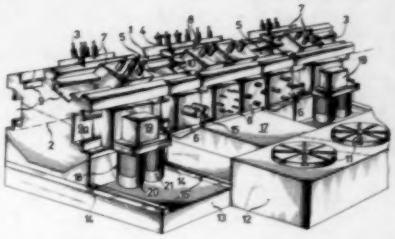
Filed Nov. 10, 1981, Ser. No. 319,918

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042564

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **6 Claims**

1. In a multi-spindle machine tool of the kind comprising a plurality of tool-carrying spindle heads stored in at least one magazine, said spindle heads being exchangeable as desired for the purpose of performing a tool change, a selected spindle head in the magazine being substituted for the one currently secured to the spindle head carrier, this latter spindle head being released from the carrier and conveyed to its predetermined storage space in the magazine, whereas the other spindle head selected in each case is withdrawn from the magazine and secured to the spindle head carrier, the invention which consists that said spindle head carrier is constructed as a turret rotatable around a longitudinal axis and is provided with spindle head holders distributed along its outer periphery, each



said magazine laterally co-ordinated with said turret having storage spaces for the spindle heads which are to be stored, said holders and said storage spaces being located at identical radial distances from said longitudinal axis and, for the purpose of reciprocal transfer of spindle heads being placeable in alignment by rotation of said turret, and wherein each said holder of said turret is turnable to an operating position in which said spindle head present in said holder in question is couplable to a spindle drive system stationarily arranged on said magazine.

4,404,730

METHOD OF PRODUCING LUMINESCENT OR LASER DIODES HAVING AN INTERNALLY LIMITED LUMINESCENT SURFACE

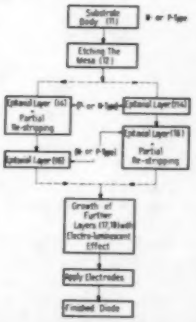
Jochen Heimen, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 349,376

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105786

Int. Cl.³ H01L *21/208*

U.S. Cl. 29—569 L **9 Claims**



1. In a method for producing a pn-luminescent or laser diode having an emission area in the semiconductor body of said diode defined by lateral limitations of a pn-junction wherein a plurality of semiconductor layers are epitaxially deposited onto a substrate body or on one another and electrodes are applied, the improvement comprising:

(1) generating a mesa having side surfaces and a top plane surface dimensioned according to a desired luminescent

surface area on a select semiconductor substrate of a first conductivity type;

(2) epitaxially depositing a first layer of a semiconductor material of a second, opposing conductivity type relative to that of the substrate, onto the surfaces of the substrates and the mesa in such a manner that said first layer is generated with a lesser thickness in the area of the mesa surfaces relative to the thickness thereof on the substrate surfaces located around said mesa;

(3) removing a sufficient portion of said first layer so that at least the entire mesa plane surface is uncovered;

(4) epitaxially depositing a second layer of a semiconductor material of the first conductivity type on said first layer and on the uncovered plane surface of said mesa; and

(5) thereafter applying a layer sequence required for luminescent or laser diodes and providing electrodes.

4,404,731

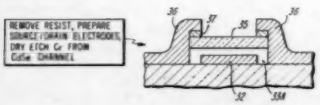
METHOD OF FORMING A THIN FILM TRANSISTOR

Michael Poleshuk, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,463

Int. Cl.³ H01L *21/363*

U.S. Cl. 29—571 **14 Claims**



5. A method of forming an active region of a thin film transistor on a substrate having a gate electrode deposited thereon which extends to the edge of the substrate to provide means for contact therewith, the method comprising depositing thin film layers of an insulator, a semiconductor, and a conductive metal upon a portion of the gate electrode and a surface portion of the substrate adjacent the gate electrode portion in successive sequence under continuous vacuum, said surface portion of the substrate and gate electrode portion being exposed by a predetermined opening in a mask to define and delineate the exact transistor dimensions by said opening.

4,404,732

SELF-ALIGNED EXTENDED EPITAXY MESFET FABRICATION PROCESS

Thomas L. Andrade, Oakton, Va., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,832

Int. Cl.³ H01L *21/203, 21/306*

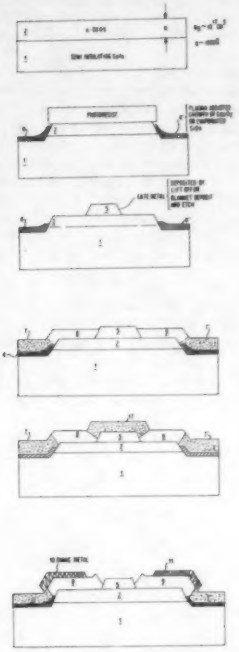
U.S. Cl. 29—571 **12 Claims**

1. An improved fabrication process for forming a gallium arsenide MESFET device, comprising the steps of:

forming an N-type gallium arsenide layer on a low conductivity substrate;

forming a refractory gate electrode on a selected portion of the surface of said gallium arsenide layer;

growing an epitaxial gallium arsenide raised source region on said gallium arsenide layer on a first side of said gate and simultaneously therewith growing a gallium arsenide raised drain region on said gallium arsenide layer on a second side of said gate opposite from said first side thereof, said source and drain regions being of N-type conductivity;



whereby a self-aligned refractory gate MESFET device having a raised source and drain, is formed.

4,404,733

METHOD OF PRODUCING SEMICONDUCTOR DEVICES

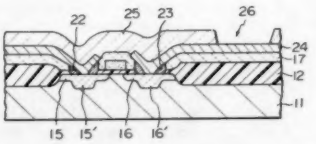
Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 27, 1982, Ser. No. 343,154

Claims priority, application Japan, Jan. 28, 1981, 56-11447

Int. Cl.³ H01L *21/223*

U.S. Cl. 29—571 **8 Claims**



1. A method of producing a semiconductor device, comprising the steps of: forming an insulating layer of silicon dioxide on a semiconductor substrate; forming a contact hole in said insulating layer; selectively introducing impurities into a portion of said insulating layer around said contact hole; heating the insulating layer to cause plastic flow of said insulating layer so as to round the edge portion thereof defining said contact hole; and forming a conducting layer within said contact hole and on said insulating layer.

4,404,734

METHOD OF MAKING A CDS/CU_xS PHOTOVOLTAIC CELL

Vijay P. Singh, El Paso, Tex., assignor to Photon Power, Inc., El Paso, Tex.

Division of Ser. No. 201,588, Oct. 28, 1980, Pat. No. 4,362,896. This application Aug. 2, 1982, Ser. No. 404,239

Int. Cl.³ H01L *31/18*

U.S. Cl. 29—572 20 Claims

1. A process for forming photovoltaic cells, comprising:

spraying onto a heated electrically conductive film of SnO_x on a transparent vitreous substrate at least one solution effective to form a crystalline film containing cadmium and sulphur,

exposing said crytalline film to a heated vapor effective to recrystallize said crystalline film to form crystals having at least one dimension greater than 0.5 microns,

vacuum evaporating a copper chloride layer onto said recrystallized film, and

heating to convert a portion of said recrystallized film to Cu_xS to a thickness between about 0.5 to 1.0 microns, thereby forming a heterojunction and associated depletion layer with a remaining portion of said recrystallized film, said remaining portion having a thickness effective to separate said depletion layer from said electrically conductive film.

4,404,735

METHOD FOR MANUFACTURING A FIELD ISOLATION STRUCTURE FOR A SEMICONDUCTOR DEVICE

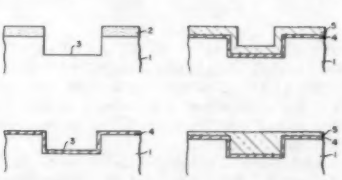
Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 13, 1981, Ser. No. 263,280

Claims priority, application Japan, May 14, 1980, 55-63573

Int. Cl.³ H01L *21/95*

U.S. Cl. 29—576 W 9 Claims



1. A method for manufacturing a semiconductor device having a semiconductor substrate, a plurality of active elements formed in said substrate and an isolation region formed in said substrate for isolating said active elements from one another, the method comprising the steps of;

forming a groove in said substrate defining said isolation region,

covering said groove with an insulating layer,

forming on said insulating layer at least in said groove a layer of a material capable of being fluidified when heated, and

irradiating said layer of said material with an energy beam to selectively heat said layer of said material and permit the same to flow into said groove, thereby to fill up said groove with said material.

4,404,736

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE OF MESA TYPE

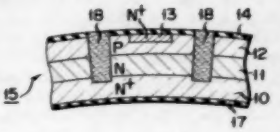
Yutaka Koshino, Yokosuka; Takashi Ajima, Tokyo; Jiro Ohshima, and Masahiro Abe, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 9, 1981, Ser. No. 319,411

Claims priority, application Japan, Nov. 13, 1980, 55/159931

Int. Cl.³ H01L *21/316*

U.S. Cl. 29—576 W 9 Claims



1. A method for manufacturing a semiconductor device of mesa type comprising:

forming mesa recesses of predetermined depth around a semiconductor element in one surface of a semiconductor body;

forming only on the entire opposite surface of said semiconductor body a film for lessening the concentration of stress;

filling glass powder into said mesa recesses; and

sintering glass powder to form glass insulators.

4,404,737

METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT UTILIZING POLYCRYSTALLINE SILICON DEPOSITION, OXIDATION AND ETCHING

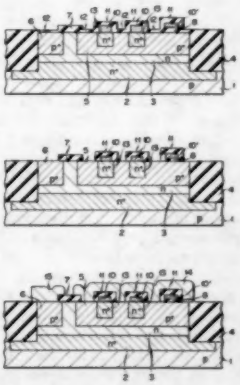
Koichi Kanzaki, Kawasaki, and Minoru Taguchi, Omiya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 28, 1980, Ser. No. 210,759

Claims priority, application Japan, Nov. 29, 1979, 54-153601; Nov. 29, 1979, 54-153603; Nov. 29, 1979, 54-154593; Dec. 21, 1979, 54-165494

Int. Cl.³ H01L *21/225, 21/31*

U.S. Cl. 29—577 C 8 Claims



1. A method for manufacturing a semiconductor integrated circuit comprising the steps of:

selectively forming a polycrystalline silicon layer containing

an impurity of second conductivity type on an exposed surface of a first conductivity type region formed in a semiconductor substrate;

forming simultaneously both a thick oxidation film on said polycrystalline silicon layer and a thin oxidation film on the remaining exposed surface of said substrated by a heat oxidation treatment;

diffusing said impurity of second conductivity type from said polycrystalline silicon layer into said first conductivity type region in said substrate to form second conductivity type regions, said polycrystalline silicon layer constituting a first electrode wiring layer connected with said second conductivity type regions;

removing said thin oxidation film by etching said oxidation films to leave a remaining part of said thick oxidation film on said polycrystalline silicon layers for forming a contact opening to said first conductivity type region; and

forming a second electrode wiring layer insulated from said first electrode wiring layer of the polycrystalline silicon by said oxidation film remaining thereon and connected with said first conductivity type region through said contact opening.

4,404,738

METHOD OF FABRICATING AN I^2L ELEMENT AND A LINEAR TRANSISTOR ON ONE CHIP

Gen Sasaki, Yokohama; Minoru Taguchi, Omiya; Koichi Kanzaki, Kawasaki, and Akihiko Furukawa, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

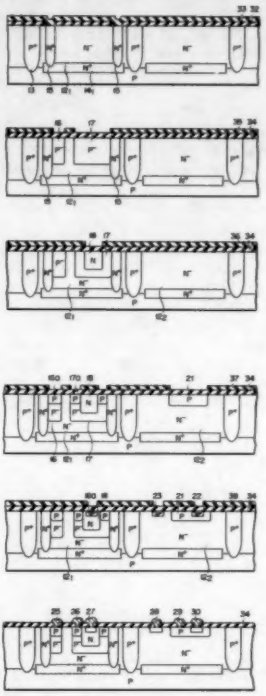
Division of Ser. No. 153,952, May 28, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,721

Claims priority, application Japan, May 31, 1979, 54-66759; Jul. 23, 1979, 54-92585

Int. Cl.³ H01L *21/20, 21/74*

U.S. Cl. 29—577 C **4 Claims**

1. A method of manufacturing an integrated circuit comprising at least one I^2L element and at least one linear transistor, comprising: a first step of forming on a semiconductor substrate of a first conductivity type high impurity concentration layers of a second conductivity type; a second step of growing an epitaxial layer of the second conductivity type on said substrate and said high impurity concentration layers; a third step of separating said epitaxial layer into a plurality of island regions by forming an isolating region of the first conductivity type, a fourth step of forming a high impurity concentration region of the second conductivity type in at least one of said island regions inn which the I^2L element is formed, said high impurity concentration region reaching said high impurity concentration layers; a fifth step of doping an impurity in said island region to form a deep injector region of the I^2L element and a deep base region of a vertical transistor, said deep injector and base regions being low impurity concentration layers of the first conductivity type; a sixth step of forming, in the base region, a collector region **18** of the vertical transistor, said region being an impurity layer of the second conductivity type; a seventh step performed after the sixth step of forming a base region of the linear transistor in at least one of the remaining island regions by doping an impurity into said island region shallower than said base region of the vertical transistor, said base region being an impurity layer of the first conductivity type; and an eighth step of forming an emitter region and a collector region of the linear transistor respectively in said base region of the linear transistor and said remaining island region, said collector region of the linear transistor being a high impurity concentration layer of the second conductivity type and said emitter region of the linear transistor being an impurity layer of the second conductivity type which has an impurity



concentration higher than that of the collector region of the vertical transistor which is formed in the base region thereof.

4,404,739

METHOD FOR MOUNTING, ELECTRICALLY ISOLATING AND MAINTAINING CONSTANT PRESSURE ON A SEMICONDUCTOR ELEMENT

Richard F. Kiley, Stoneham, and Ralph I. Larson, Jr., North Reading, both of Mass., assignors to Thermal Associates, Inc., North Reading, Mass.

Continuation-in-part of Ser. No. 142,862, Apr. 21, 1980, abandoned, and Ser. No. 171,827, Jul. 24, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,174

Int. Cl.³ H01L *21/52, 21/58*

U.S. Cl. 29—588 **11 Claims**

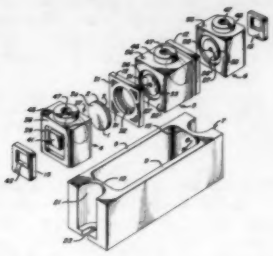
1. A method for mounting a semiconductor element having opposing sides in a retaining frame to facilitate electrical connection and double-side cooling of said element, comprising:

positioning said element between two electrically and thermally conductive members;

applying to said members external force to maintain said members in electrical and thermal contact with the opposing sides of said element;

fixing said members in said retaining frame by means of bonding means, said members being electrically isolated from said retaining frame by thermally conductive insulation means;

removing said external force from said members, so that said members are maintained in electrical and thermal contact



with said semiconductor element by said bonding means to cooperation with said retaining frame.

4,404,740

METHOD FOR MOUNTING A WINDING IN A TRANSFORMER

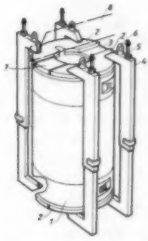
Rune Hägg, and Lennart Lundström, both of Ludvika, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Aug. 6, 1980, Ser. No. 175,632

Claims priority, application Sweden, Aug. 9, 1979, 7906678

Int. Cl.³ H01F *41/02*

U.S. Cl. 29—606 **4 Claims**



1. Method for mounting a prepressed annular complete winding unit on a transformer core, comprising the steps of:

prepressing said winding unit to a first compressing pressure with a separate winding press within a range of approximately 50% to 65% of a final desired compressing pressure required for a finished transformer;

retaining said winding unit in a compressed condition at said first compressing pressure by adjustable clamping members engaging respective opposite upper and lower end faces of the winding unit such that said clamping members extend outside thereof;

mounting said winding unit still in said first compressed condition together with said clamping members onto a transformer core such that said lower winding unit end face rests on a lower yoke and press beam;

interleaving an upper yoke with said upper transformer core end face;

engaging an upper press beam with said upper yoke;

removing said adjustable clamping members; and then

further compressing said winding unit to said final desired compressing pressure.

4,404,741

DEVICE FOR THE ALIGNMENT OF A PART AND A SUBSTRATE FOR CARRYING THE PART

Jean-Philippe Lebet, Les Geneveys; Leonardo Peterle, Buttes, and Fernand Matthey-Doret, Le Locle, all of Switzerland, assignors to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

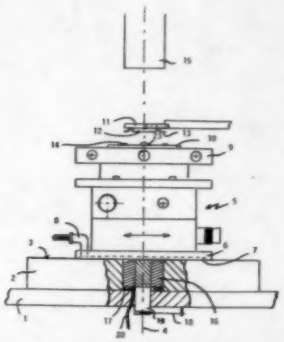
PCT No. PCT/CH81/00056, § 371 Date Oct. 9, 1981, § 102(e) Date Oct. 9, 1981

PCT Filed May 19, 1981, Ser. No. 309,907

Claims priority, application Switzerland, May 19, 1980, 3877/80; European Pat. Off., May 5, 1981, 81.810170.1

Int. Cl.³ H05K *3/30, 13/04*

U.S. Cl. 29—721 **8 Claims**



1. A device for the alignment of a part and of a substrate designed to receive said part, said device comprising:

a plate having a horizontal flat upper surface, said plate being mounted on a fixed base;

an XY moving table connected with a movable base, said movable base mounted for sliding movement relative to said upper surface of the plate, said table supporting said substrate;

a blocking device for momentarily preventing translational movement of the movable base on said upper surface, but allowing said base to rotate about a given vertical axis;

a gripping device to bring the part over the substrate approximately along said given vertical axis and to deposit it vertically onto said substrate; and

an optical device for viewing the part and the substrate with the direction of observation being along said given vertical axis.

4,404,742

METHOD AND APPARATUS FOR MOUNTING RIVETS OR THE LIKE IN A FLEXIBLE CARRIER

Ralph Fuhrmeister, Coopers Plains, Australia, assignor to Furma Manufacturing Co. Pty. Ltd., Coopers Plains, Australia

Filed Jul. 7, 1981, Ser. No. 281,039

Claims priority, application Australia, Jul. 18, 1980, PE4596

Int. Cl.³ B23P *19/00*; B25C *5/02*

U.S. Cl. 29—798 **4 Claims**

1. Apparatus for charging a carrier strip of pliable, resiliently deformable material with a series of similar articles, comprising:

(a) a striker, and means for advancing and retracting the same toward the strip for driving the article at least partially therethrough said strip in response to advancement of said striker, causing said strip to stretch and be formed with a punched hole for receiving said article,

(b) die means including a central die aligned coaxially with said striker, and a series of equally spaced apertures aligned with said central die to receive and closely engage

articles driven by said striker partially through said strip, said central die being formed to permit stretching of said strip by said article,

(c) means for advancing and retracting said die means toward and away from said strip,

(d) feed means for sequentially feeding the articles to the strip in alignment with and between said striker and said die means,

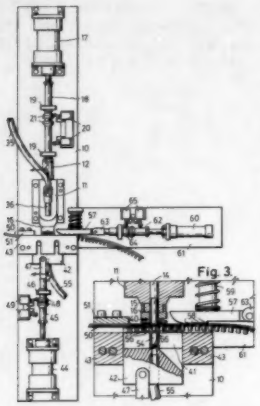


Fig. 3.

(e) means for guiding said strip between said striker and said die means, in alignment with said central die and said apertures formed in said die means, and

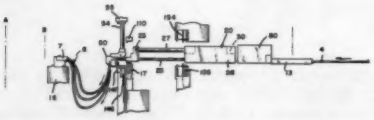
(f) means for advancing the strip, said advancing means engaging and moving articles driven through said strip so as to present a blank strip in the region of said central die.

4,404,743

ELECTRICAL HARNESS FABRICATION USING IMPROVED WIRE MEASURING METHOD

Joseph E. Brandewie, Dunedin, and Granville S. Hart, Clearwater, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 26, 1981, Ser. No. 267,108
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—857 **4 Claims**



1. In the method of manufacture of electrical harnesses of the type comprising an insulating connector block having a plurality of contact terminals therein, said terminals being arranged in side-by-side relationship in a row, wires having their ends connected to said terminals, said method comprising the step of feeding each of said wires from an endless source of wire toward said connector block by means of feed roll means, the wires being fed along a wire feed path in side-by-side coplanar relationship toward said connector, said method being characterized in that:

after said wires are connected to said terminals in said connector block and said connector is positioned at a predetermined location in said feed path which is downstream, relative to the direction of wire feed, from said feed rolls, wire deflector means is positioned on said feed path between said connector and said feed roll means, said deflector means having deflecting surface portions which bear against respective wires,

said feed roll means is thereafter actuated to feed lengths of wire from said wire sources axially against said deflecting surface portions to form loops in said wires transversely of the plane of said feed path between said deflector means and said connector block, said deflector means remaining stationary during wire feed,

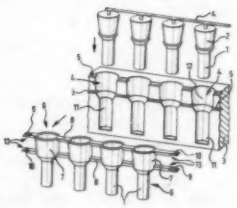
said wires are thereafter cut at a location between said deflector and said feed roll means.

4,404,744

METHOD OF MAKING ELECTRICAL CONTACTS

Paul Stenz, and Manfred Wilmes, both of Detmold, Fed. Rep. of Germany, assignors to C. A. Weidmuller K.G., Detmold, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 195,819
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941770
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—883 **4 Claims**



1. A method of making a strip of mechanically interconnected insulated electrical contacts each comprising a tubular crimpable metal contact pin and an insulating tubular plastic sleeve extending from one end of said contact pin, comprising the steps of

(a) providing an injection mold having a plurality of elongated mold cavities side by side, each cavity having first and second opposite end regions, and said mold further having ducts transversely interconnecting said first end regions of said mold cavities;

(b) disposing a respective said contact pin in the second end region of each said cavity; and

(c) injecting plastic material into said first end regions and said ducts, thereby forming in said first end regions said insulating tubular plastic sleeeves directly bonded to respective ends of said contact pins in substantially end-to-end relation, said sleeves having a larger diameter than, and extending axially away from, said contact pins, and forming in said ducts members integral with said sleeves and mechanically interconnecting said sleeves to form said strip of interconnected contacts.

4,404,745

PROCESS FOR SEALING VHF COMPONENT IN CASE

Jean C. Resneau; Jean Doyen, and Robert Ribier, all of Paris, France, assignors to Thomson-CSF, Paris, France

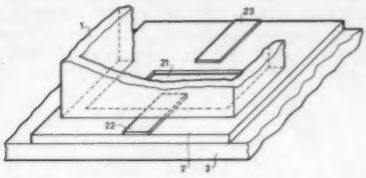
Filed Feb. 26, 1981, Ser. No. 238,600
Claims priority, application France, Feb. 26, 1980, 80 04208
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—841 **3 Claims**

1. A process for the hermetic sealing of a very-high-frequency component in a case, said process comprising the steps of:

manufacturing of a first and a second part from green alumina by grinding, drying and pressing of said parts after addition of organic binders;

heating said first and second manufactured parts at 1000° for a period of time greater than one hour;

depositing by silk-screen printing of refractory metalizations made from an alloy refractory at the sintering temperature of said green alumina on the large face of one of said parts in order to form conducting crossovers on the contacting



surface of said first and second parts and stove-drying said first and second manufactured parts at 100° C.;

positioning and assemblying said first and second parts and compressing said first and second parts together; and

heating said assembled parts at 1500° C. for a period of more than one hour.

4,404,746

WIRE RETAINER AND DIAGONAL CUTTING NIPPER WITH WIRE RETAINER

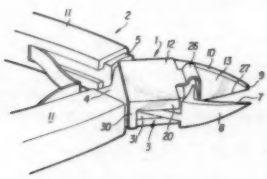
Conny Jansson, Enköping; Lars Erlandsson, and Rolf Appelkvist, both of Eskilstuna, all of Sweden, assignors to AB Bahco Verktyg, Enkoping, Sweden

Filed Dec. 19, 1980, Ser. No. 218,074

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.³ B26B *17/00*

U.S. Cl. 30—124 **4 Claims**



1. A wire retainer made from sheet metal for attaching to a diagonal cutting nipper or box joint nipper of the kind consisting of two members crossing over each other at a box joint portion including a slot, and which are pivotably kept together by a hinge means at the joint portion to form jaws provided with cutting edges forwards of the joint portion, and nipper arms rearwards of the joint portion, the retainer serving to prevent offcuts from dropping during wire cutting with the nipper, when the retainer is fitted to a first one of the members of the nipper, the retainer comprising an attachment portion and a wire retainer tongue integral therewith, which projects outwardly form the attachment portion and is adapted to come into resilient yielding engagement against the jaw of a second one of the member when the jaws are closed, the attachment portion consisting of a plate with a front edge, a rear edge and two side faces formed by flanges upstanding in the same direction from the plate, a first flange being formed at the front edge of the plate with a first flap bent at substantially 180° to form a hook, while the opposing second flange is bent substantially at right angles to the plate and includes a second flap at the rear of the plate, said second flap being bent at substantially 180° to form a hook, the tongue comprising a flap projecting from the front edge of the plate, with a rear portion joined to the front edge of the plate and bent from said edge outwards in a direction away from said both flanges and bent over inwards in a curve to merge into a forward portion extending forwards from the rear portion in the form of a blade which is oblique in relation to the plate.

4,404,747

KNIFE AND SHEATH ASSEMBLY

Walter W. Collins, Clover, S.C., assignor to Schur, Inc., Natick, Mass.

Filed Jul. 29, 1981, Ser. No. 287,917

Int. Cl.³ B26B *29/02*

U.S. Cl. 30—151 **6 Claims**

1. In combination a knife having a handle and blade and a sheath having a knife encasing portion and a hanger extending therefrom, means for securing said knife in said sheath comprising:

a detent assembly;

means supporting said detent assembly in said handle, said supporting means removably engaging said handle and a blade extension into said handle whereby removal of said supporting means permits separation of said blade and handle;

means spring loading a detent and forming a portion of said detent assembly to partially project from said handle;

means forming a hole in said hanger into which said detent projects when said knife is in said sheath, whereby said detent engages said hanger to prevent removal of said knife from said sheath unless said detent is pushed against said spring pressure to disengage it from said hanger while said knife is being withdrawn from said sheath.

4,404,748

FOLDING KNIFE

Günter Wiethoff, Solingen, Fed. Rep. of Germany, assignor to Firma Cuno Melcher KG ME-Sportwaffen, Solingen, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,014

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101028; Sep. 12, 1981, 3136325

Int. Cl.³ B26B *1/00, 29/00*

U.S. Cl. 30—161 **11 Claims**

1. A folding knife comprising:

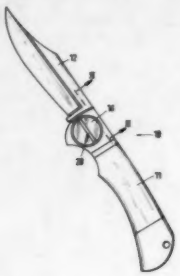
a blade with a longitudinal cutting edge ending in a point and a blunt end opposite said point provided with a circular hole;

a handle having a body integrally formed with substantially coextensive first and second cheeks separated by a pocket accommodating said blade in a retracted position of the latter, said first and second cheeks being provided with aligned first and second cutouts extending in line with said hole from said pocket to the outer cheek surfaces;

a first and second member respectively lodged in said first and second cutouts and rigidly interconnected by a stem

of the same diameter as said hole forming part of one of said members and traversing said hole, said members being separated by a distance sufficient to enable their joint displacement along the axis of said bore between a normal and an off-normal position; and

spring means engaging said first member in said first cutout for biasing said members into said normal position, said



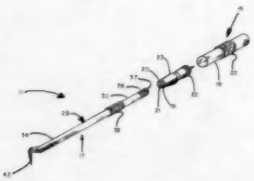
second member being nonrotatable about said axis and being provided with a retaining formation engaging a coacting formation on said blunt end in the retracted position and in an extended position of said blade, axial depression of said first member against the force of said spring means disengaging said formations for enabling a pivoting of said blade about said axis.

4,404,749

COMBINATION TOOL APPARATUS

Clarence A. Emerson, Bozeman, Mont., assignor to King Tool Inc., Bozeman, Mont.

Filed Aug. 6, 1981, Ser. No. 290,685
Int. Cl.³ B26F *1/24*
U.S. Cl. 30—164.9 **5 Claims**



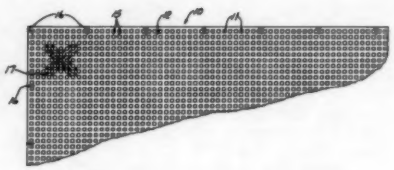
1. Combination tool apparatus including a handle portion and a tool portion; said handle portion including an elongated handle member, said handle member having a generally cylindrical configuration, said handle member including an opening extending into said member from one end thereof, said opening including an internal sidewall section, gripping means disposed along at least a portion of the outer surface of said handle member; said tool portion including a plurality of interchangeable pick members selectively connectable with said handle member, said pick members and said handle member being mateable through threaded sections, each of said pick members including a shank section, an external portion adjacent one end of said shank section mateable with said end opening in said handle member, said shank section including gripping means disposed along the length of the outer surface of said shank section adjacent to said external end portion thereof, said gripping means on said handle member and said pick members including knurled sections, a pick section extending from the end of said shank section opposite to said external end portion, said pick section including a pointed end portion extending from the free end of said pick member, one of said pick members including a pick section with a substantially straight configuration, another of said pick members including a pick section with a right angle configuration, a third of said pick members including a pick section with a hook configuration, a fourth of said pick members including a pick section with an ascending spiral configuration, said spiral configuration extending around an arc of less than 180°, a storage case for said handle member and said pick members, said storage case including a substantially flat body portion with a plurality of adjoining elongated pocket sections; whereby the external end portions of said pick members alternately may be threaded into the internal opening of said handle member to provide a picking tool.

4,404,750

NEEDLEPOINT SHEET

Michael K. Marx, 905 Mt. Hood Dr., Pittsburgh, Pa. 15239, and Louis P. Musante, 45 Maple Dr., Fairview, Pa. 16415

Filed Mar. 11, 1981, Ser. No. 242,637
Int. Cl.³ D03D *29/00*
U.S. Cl. 33—1 B **5 Claims**



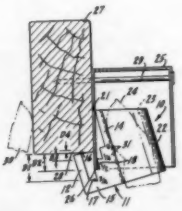
1. A needlepoint sheet of flexible plastic material having a plurality of aligned rows of perforations therein for receiving thread-like material therethrough, at least one face of said sheet being flat, said perforations having side walls in the form of a pyramid frustrum.

4,404,751

HAND TOOL FOR MOUNTING AN ELECTRICAL BOX

Ivan L. Rieckenberg, Rte. 1, Box 148E, Steeleville, Ill. 62288

Filed Mar. 16, 1982, Ser. No. 358,840
Int. Cl.³ B25B *1/00*
U.S. Cl. 33—180 R **8 Claims**



1. A hand tool for use in mounting an electrical box on a structural member, such as a wall stud, with the rim of the box displaced from the outer surface of the structural member by a predetermined distance D, comprising:

a jig of substantially V-shaped cross sectional configuration, including first and second rigid legs joined at a base;

the first leg of the jig having an elongated linear primary gauge surface at its upper edge for engaging the outer surface of the structural member, and having an effective height equal to the distance D;

the base of the jig having an elongated linear secondary gauge surface for engaging the rim of one wall of an

electrical box, the secondary gauge surface extending parallel to the primary gauge surface;

the second leg of the jig having a height substantially greater than the height of the first leg but substantially less than the depth of the box and having a tertiary gauge surface at its upper edge for engaging the inner surface of said one wall of the electrical box;

and a finger grip mounted on and extending transversely on the second leg of the jig to enable a workman to hold the jig in place on the rim of an electrical box and to maintain the box and jig in position on the structural member with one hand while securing the box to the structural member with the other hand;

the entire tool constituting a single, unitary molded member.

4,404,752

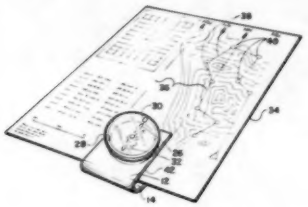
CLIP-ON COMPASS

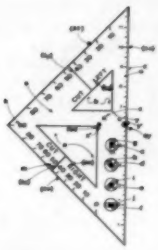
John W. Hanna, 4076 Crown Point Dr., San Diego, Calif. 92109

Filed Jan. 3, 1981, Ser. No. 270,083

Int. Cl.³ G01C *17/04*

U.S. Cl. 33—347 **1 Claim**





1. A clip-on compass assembly comprising:

(a) a non-ferromagnetic frame;

(b) a "North" indicator on said frame;

(c) a compass needle pivotally mounted to said frame and allignable with said indicator;

(d) a clamp mounted on said frame for clamping a map beneath said compass needle;

(e) said frame including a mounting plate with said needle mounted atop same and said frame also having a reference line-defining structure alignable with a reference line on a map engaged by said clamp;

(f) Said clamp comprising a cam-type over-the-center device with a roller which clamps against the bottom of said plate; and,

(g) said plate having an extended resilient end with a spaced return portion defining a deep bay to receive a map, with said clamp being pivoted to said end.

4,404,753

CARPENTER'S SAW GUIDE AND SQUARE

Henri Klok, P.O. Box 13714, Houston, Tex. 77219

Filed Dec. 15, 1981, Ser. No. 330,966

Int. Cl.³ G01C *9/24*

U.S. Cl. 33—451 **1 Claim**

1. A measuring, angle marking, squaring, and saw guiding device comprising an isosceles right triangle with the hypotenuse forming a measuring and guiding edge having a calibrated scale with its zero index at one end and progressing onward to the opposite end of said hypotenuse, which has mounted to the underside face exactly at the midpoint of the hypotenuse a squaring and pivot flange whose edges create two distinct protraction conditions relative to the edges of the isosceles triangle formed by said equal legs, with the outward edge of said flange forming a pivot point aligned with the midpoint of said hypotenuse and the inside pivot flange located a predetermined distance along an imaginary line bisecting said isosceles triangle and said flange being perpendicular to the mentioned hypotenuse with a second smaller reinforcing flange parallel to said hypotenuse welded to the inside edge of the pivot flange but located opposite the pivot flange's intended angling and squaring edge that is transversely aligned exactly on the midpoint of said hypotenuse; the first leg of said isosceles forming a protractor condition with the midpoint of the hypotenuse and said leg graduated from 0 to 90 degrees from the hypotenuse to apex of the isosceles and the second leg forming a protractor condition with mentioned inside pivot point and graduated from 90 to 0 degrees from the apex toward the hypotenuse, but short of the hypotenuse exactly the dimension the pivot flange creates, said inside pivot point being itself an apex for a smaller proportionate right isosceles triangle removed in actual material to reduce the weight of the device in the second of two equal halves formed figuratively by an imaginary line which is coincidental with the 90° apex point and the midpoint of said hypotenuse, with an even smaller right isosceles triangle removed in actual material from the first half section, said first section being heavier in mass than the second to retain the device balanced in place during actual use, said section is furthermore reduced in mass by four equal, rounded apertures bored out and removed in actual material; all four apertures located in line and parallel to said hypotenuse, cradeling in each a small leveling device that corresponds individually in parallel to each of the three legs of said isosceles triangle as well as to the stated pivot flange; said flange projects from the underside surface which is calibrated and graduated in a manner of a mirror reflection identical to the top surface so that the pivot points are identical and said device can be laid flatly upon its top surface and be used according to similar functions of measuring, angle marking, and squaring on a planar surface; or be used conversely with the pivot flange abutting and pivoting mentioned edges against a given material, and the calibrated hypotenuse forming a respective angle that can be utilized.

4,404,754

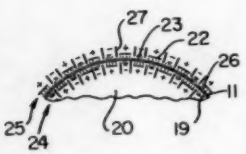
ELECTROSTATIC METHOD FOR TREATING MATERIAL

James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 261,784, May 8, 1981, Pat. No. 4,338,729, which is a division of Ser. No. 124,224, Feb. 25, 1980, Pat. No. 4,283,862, which is a division of Ser. No. 50,807, Jun. 2, 1979, Pat. No. 4,208,807, which is a continuation-in-part of Ser. No. 925,378, Jul. 17, 1978, abandoned, which is a division of Ser. No. 863,910, Dec. 23, 1977, Pat. No. 4,111,773, which is a continuation-in-part of Ser. No. 732,846, Oct. 15, 1976, Pat. No. 4,081,342, which is a continuation-in-part of Ser. No. 695,068, Jun. 11, 1976, Pat. No. 4,033,841, which is a continuation-in-part of Ser. No. 569,815, Apr. 21, 1975, Pat. No. 3,966,575, which is a continuation-in-part of Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898, which is a continuation-in-part of Ser. No. 383,255, Jul. 27, 1973, Pat. No. 3,849,275, which is a division of Ser. No. 263,605, Jun. 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, Jul. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 25,938, Apr. 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, Mar. 28, 1969, abandoned, said Ser. No. 569,815, is a continuation-in-part of Ser. No. 548,666, Feb. 10, 1975, Pat. No. 3,965,581, which is a continuation-in-part of Ser. No. 469,820, May 14, 1974, Pat. No. 3,931,682, Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449, and Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898. This application Nov. 9, 1981, Ser. No. 319,114

Int. Cl.[3] F26B *3/34*; B01D *57/02, 13/02*

U.S. Cl. 34—1 20 Claims



1. In a method for drying material comprising the steps of disposing said material in a heating means to have said heating means heat at least part of the liquid particles of said material, disposing charged electrode means so as to be adjacent one side of said material when said material is disposed in said heating means and to define a plurality of electrostatic fields that are serially arranged in substantially a like repeating pattern and that are substantially constant and non-oscillating so that said fields at least partially extend through said material while said material is disposed in said heating means, and moving said material in one direction through said heating means to cause at least a portion of said material to have the particles of liquid thereof serially moved through said electrostatic fields while said portion of said material is being heated in said heating means whereby said electrostatic fields augment the drying effect of said heating means on said material, the improvement comprising the step of disposing means between each pair of adjacent electrostatic fields to change the normal shape of said adjacent electrostatic fields between said electrode means and said material so that when said material is moved in said one direction said particles of liquid of said portion serially move through the thus reshaped electrostatic fields while said portion of said material is being heated by said heating means.

4,404,755

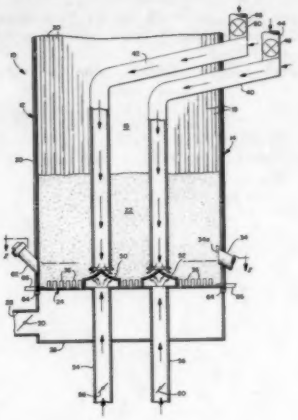
FLUIDIZED BED HEAT EXCHANGER UTILIZING INDUCED DIFFUSION AND CIRCULATION

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 25, 1981, Ser. No. 296,021

Int. Cl.[3] F26B *17/10*

U.S. Cl. 34—57 A 4 Claims



1. A fluidized bed heat exchanger comprising a perforated plate adapted to support a bed of particulate material, means for introducing air through said perforations to fluidize said particulate material, at least one feeder pipe having a substantially vertical portion which extends from an area above said bed into said bed for introducing a mixture of air and additional particulate material into said bed, means disposed immediately below said feeder pipe and in the path of said mixture as it discharges from said feeder pipe for deflecting said mixture in a substantially horizontal direction laterally across said bed, and means for introducing additional air into said deflecting means, said deflecting means including means for discharging said latter air into said bed in a substantially horizontal direction laterally across said bed, said means for introducing said mixture, said means for introducing said air, and said means for introducing said additional air being adapted to be controlled so that a relative dense column of particulate material is formed at said bed portion to induce circulation of the material downwardly and laterally across said bed.

4,404,756

GRAIN DRYING AND CONDITIONING APPARATUS

Ronald T. Noyes, Frankfort, Ind., assignor to Beard Industries, Inc., Frankfort, Ind.

Filed Jun. 12, 1981, Ser. No. 272,887

Int. Cl.[3] F26B *17/12*

U.S. Cl. 34—65 35 Claims

1. Apparatus for drying and conditioning grain comprising:

wall means including an upper portion, a lower portion and an intermediate portion between the upper and lower portions, for containing and guiding grain downwardly by gravity from the upper portion to the lower portion;

airflow means connected to said wall means for permitting air to pass through the grain as such grain moves downwardly;

air circulation means, including an inlet and an outlet for causing air movement;

a plenum chamber in communication with said air flow means;

means for connecting the outlet of the air circulation means

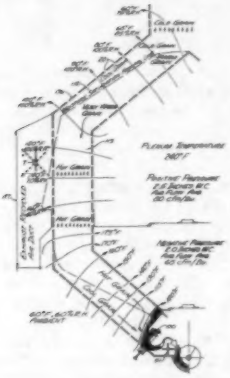
to the plenum chamber whereby said plenum chamber is pressurized and air is thereby forced through a first portion of the airflow means for drying the grain;

means for heating the air being forced into the plenum chamber;

recirculation means for selectively directing at least some of the heated air that has passed through the airflow means and grain back to the inlet of the air circulation means, said recirculation means including means for forming a recirculation chamber for receiving said air forced through said first portion of the air flow means;

adjusting means connected to said recirculation means for selectively controlling the amount of air that is recirculated by said recirculation means; and

valve means connected to said recirculation means and being disposed in said recirculation chamber for controlling the relative amount of air in said recirculation chamber that is directed back for circulation and the amount of air that is directed to exhaust to atmosphere, said valve means includes a plate means pivotally attached to said recirculation means, said plate means being wider than said chamber for dividing said recirculation chamber into two unequal parts, a recirculation part and an exhaust part, and having a first rotary position wherein one edge of said plate means engages one portion of said airflow means on one side of said recirculation chamber and an opposite edge of said plate means engages one portion of said recirculation means on an opposite side of said recirculation chamber, said plate means having a second rotary position wherein said one edge of said plate engages another portion, spaced from the first portion, of said airflow means on said one side of said recirculation chamber and the opposite edge of said plate member engages another portion, spaced from said one portion, of said recirculation means on the opposite side of said recirculation chamber, said first position of said plate means causing more of said air from said airflow means to be recirculated and less air to be exhausted to atmosphere than when said plate means is in the second position thereof.



4,404,757

HEEL FILLER AND ASSEMBLY FOR BOOTS

Henry D. Sweeny, Kitchener, Canada, assignor to Swenco Limited, Waterloo, Canada

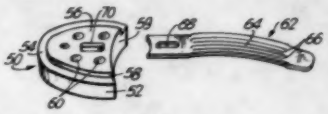
Filed May 13, 1981, Ser. No. 263,256

Claims priority, application Canada, Apr. 8, 1981, 374968

Int. Cl.³ A43B *23/22, 23/00*

U.S. Cl. 36—107 **20 Claims**

9. A heel filler for location in the heel portion of a boot or shoe, said heel filler comprising a block of molded plastics material having a top surface, a bottom surface, side walls, a forward wall and a rearward wall and having a shank or protective mid-sole locating member in the form of an elongated rib projecting upwardly from said top surface.



4,404,758

SKIING BOOT

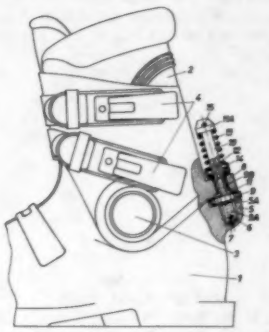
Ernst Kopp, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Jan. 22, 1982, Ser. No. 341,788

Claims priority, application Austria, Jan. 26, 1981, 312/81

Int. Cl.³ A43D *5/04*

U.S. Cl. 36—121 **6 Claims**



1. A skiing boot comprising a lower shell which substantially surrounds the foot, a gaiter hinged to the lower shell near the ankle, means for adjusting the inclination of the gaiter relative to the lower shell and for exerting a force opposing the forward pivotal movement of the gaiter, said lower shell and said gaiter having a rear portion each, each of the two rear portions of the lower shell and the gaiter having a holder, an adjusting screw being provided between said holders and comprising oppositely handed screw threads and an adjusting wheel fixed between said screw threads, and a guide pin being longitudinally slidably held on said holder of said gaiter, which guide pin interengages with said adjusting screw and carries resilient means.

4,404,759

ATHLETIC SHOE, ESPECIALLY JOGGING SHOE

Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,772

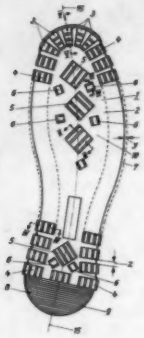
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 8022761[U]

Int. Cl.³ A43B *5/00, 13/04*

U.S. Cl. 36—129 **23 Claims**

1. Athletic shoe, especially a jogging shoe, with a tread sole formed of rubber or a rubber-like synthetic resin, the sole being provided at least partially with cleat-like projections distributed over the tread surface remote from the periphery of the sole and additional cleat-like projections sub-divided in the manner of a link chain distributed along a rim of the sole, characterized in that the cleat-like projections are equipped on

contact surfaces on a bottom side thereof with blade-like projections which are constructed for increasing the shock-



absorbing effect and simultaneously enhancing the gripping effect of the sole, said blade-like projections of each cleat-like projection extending essentially in parallel to one another.

4,404,760

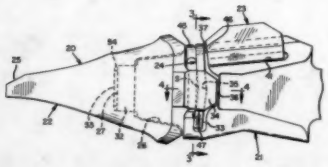
EXCAVATING TOOTH

Frecerick C. Hahn, Aloha; William R. Barber, Jr., Portland, both of Oreg., and David A. Hampel, Vancouver, Wash., assignors to Esco Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 144,368, Apr. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 235,771, Feb. 25, 1981, Pat. No. 4,335,532. This application Feb. 24, 1982, Ser. No. 351,769

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—142 R **18 Claims**



1. An excavating tooth comprising an adapter element and a point element, said adapter element having means at one end for connection to a bucket or the like and a nose at the other end for coupling to said point element, said point element having an earth engaging edge at one end constituting the tooth forward end and a socket at the other end for coupling to said adapter element, said nose and socket being equipped with straight, longitudinally extending rail and groove means, and lock means externally of said nose releasably connecting said elements to prevent inadvertent disassembly of said elements, said lock means including rearwardly extending tongues on said point element and recesses on said adapter element, and rod means interposed between said tongues and recesses.

4,404,761

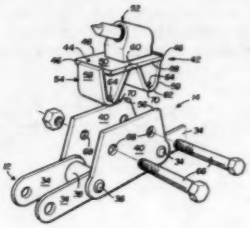
DIGGING TOOTH MOUNTING BRACKET

Stephen V. Paulin; Randy H. Hillard, both of Wichita, and Stephen A. Youngers, Clearwater, all of Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Jul. 6, 1981, Ser. No. 280,747

Int. Cl.³ E02F *3/14*

U.S. Cl. 37—191 A **1 Claim**



1. A support assembly for digging teeth comprising:

a digging tooth mounting bracket which is secured to opposed, spaced apart adaptor links, said adaptor links having upper ends and aligned mounting openings therethrough for attaching said mounting bracket, said mounting bracket including a base having opposed vertical end surfaces, opposed vertical side surfaces, and a top surface for mounting a digging tooth cutter bit;

a one-piece continuous plate-like mounting member attached to said base, said mounting member being generally in the shape of a "W" in longitudinal cross-section and including opposed divergent leg portions that are secured against the opposed end surfaces of said base, each divergent leg portion being of a width less than the length of the end surface to which it is secured, said mounting member having a mid-portion with an upper radiused terminal end that engages the underside of said base, said divergent leg portions joined to said mid-portion through radiused bottom portions for forming a plurality of transversely disposed large, open area mounting slots or grooves that fit between said opposed, spaced apart adaptor links for attachment thereto, said large, open area mounting slots or grooves being formed between said divergent leg portions and said mid-portion; and

fastening means extendable through the mounting openings in one of said adaptor links into the large, open area mounting slots or grooves between said divergent leg portions and said mid-portion, said fastening means engaging said bottom radiused portions and extending through the mounting openings in the other adaptor links to thereby secure said mounting bracket base to said upper ends of said adaptor links.

4,404,762

SKI TRAIL RESURFACING APPARATUS

Gerald A. Munsterer, 390 State Hwy. No. 15 S., Wharton, N.J. 07885

Filed Feb. 8, 1982, Ser. No. 346,506

Int. Cl.³ E01H *8/04*

U.S. Cl. 37—219 **6 Claims**

1. Ski trail resurfacing apparatus, comprising:

first means defining a blower;

said first means having means for admitting a mixture of snow and air thereinto, and means for discharging a mixture of snow and air therefrom;

first duct means in fluid-flow communication with said admitting means; and

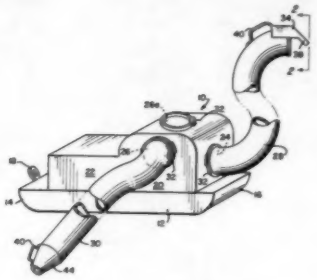
second duct means in fluid-flow communication with said discharging means; wherein

said first duct means comprises a flexible duct having one end thereof opening into said admitting means;

said second duct means comprises a second duct having one end thereof opening into said discharging means;

said first duct has means, on the end thereof which is opposite said one end, for manually gripping said opposite end, said manipulating and orienting said first duct and said opposite end;

said first duct further has, on said opposite end thereof,



means for scarifying accretions of snow, and baffle means, in said opposite end thereof, for inhibiting the ingestion of large objects;

said scarifying means comprises means defining a plurality of depending teeth, immovably fixed to, and which extend in partial traverse of, said opposite end, and at an angle outwardly therefrom; and

said baffle means comprises a plurality of linear elements bridging across said opposite end, in substantial parallelism, and transverse to said teeth.

4,404,763

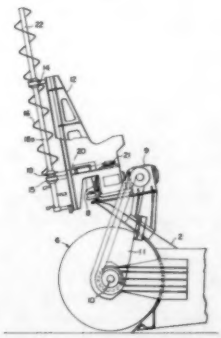
ROTARY SNOW PLOUGH

Takashi Sakano, and Mikio Igarashi, both of Niigata, Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 140,540, Apr. 15, 1980, abandoned. This application Nov. 25, 1981, Ser. No. 324,937

Int. Cl.³ E01H *5/09*

U.S. Cl. 37—250 **9 Claims**



1. A rotary snow plough vehicle including a frame positioned in front of said vehicle, and a main auger supported to said frame and adapted to level a snow bank and introduce the same into a blower, comprising:

(a) an auxiliary auger swingably mounted above said main auger, a swingable range of said auxiliary auger being from a horizontal position approximately above said main auger to a position laterally outside of said vehicle;

(b) means for swingably moving said auxiliary auger along a vertical plane perpendicular to an advancing direction of said vehicle in order to level an upper section of said snow bank;

(c) transmission means for transmitting rotation of said main auger to said auxiliary auger to rotate said auxiliary auger about its axis, said transmission means comprising a deceleration means disposed on said frame, said deceleration means having a central shaft extending toward the advancing direction of said vehicle, said supporting arm being swingable about said central shaft;

(d) an endless chain trained between said main auger and said deceleration means;

(e) a first bevel gear integrally and coaxially secured to said central shaft;

(f) a second bevel gear in meshing engagement with said first bevel gear;

(g) a first sprocket wheel provided coaxial and integral with said second bevel gear;

(h) a second sprocket wheel provided coaxial and integral with said auxiliary auger; and

(i) an endless chain trained over said first and second sprocket wheels.

4,404,764

MESSAGE MEDIUM HAVING CORRESPONDING OPTICAL AND TACTILE MESSAGES

David V. Wills, and Angela B. Wills, both of Philadelphia, Pa., assignors to Handy C. Priester, West Covina, Calif., a part interest

Filed Aug. 7, 1981, Ser. No. 291,114

Int. Cl.³ B42D *15/02*; G09F *1/02*

U.S. Cl. 40—124.1 **3 Claims**

1. A medium for conveying information among sighted and sightless persons, comprising:

a greeting card;

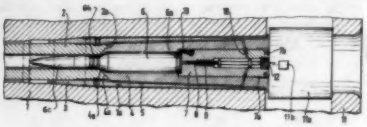
an optically discernible message printed on the card, the optically discernible message having scenic and textual elements, the scenic elements corresponding to a visual scene and the textual elements corresponding to words; and,

a tactilely discernible message including braille impressions formed in the card, the tactilely discernible message being a transcription of the optically discernible message, the tactilely discernible message and optically discernible messages having corresponding content and having elements placed in corresponding positions, the tactilely discernible message being braille dots imprinted on both a front surface and a rear surface of the medium, the medium having raised braille dots, depressed braille dots, areas of mixed raised and depressed dots, and open areas, whereby at least four degrees of textured areas are provided, the textured areas corresponding to elements of the optically discernible message, the optically discernible message and the tactilely discernible message conveying both scenic and textual information.

4,404,765
GUN BARREL INSERT

Helmut Reudelsterz, Bochingen, and Gerd Kellner, Schramberg, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,421
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 8009469
Int. Cl.³ F41F *17/06*; F41C *21/10, 21/12*
U.S. Cl. 42—77 10 Claims



1. A small caliber cartridge assembly for a large caliber gun having a firing mechanism, a large caliber cartridge chamber and barrel, comprising:

a small caliber barrel insert axially and radially fixed in the barrel;

a chamber tube inserted in the large caliber cartridge chamber;

an adapter member adapted to be inserted into said chamber tube;

a small caliber cartridge connected to said adapter member and having a projectile adapted to be inserted into and fired through said small caliber barrel insert;

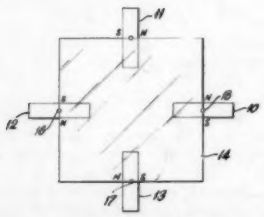
said adapter member being substantially rotationally symmetrical and having a tapered outer surface tapered toward said small caliber cartridge and toward said barrel insert, said adapter member including a conical forward end extending toward said small caliber cartridge projectile, said barrel insert having a conical rear face against which said front conical end of said adapter member is adapted to bear; and

firing means in said adapter member responsive to the large caliber gun firing mechanism to fire said small caliber cartridge.

4,404,766
MAGNETIC TOY

Kalman A. Toth, 24 Jean La., Monsey, N.Y. 10952

Filed May 12, 1981, Ser. No. 262,902
Int. Cl.³ A63H *33/26*; G09F *19/00*
U.S. Cl. 46—239 5 Claims

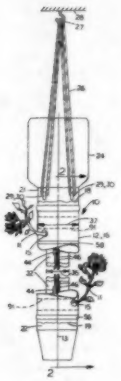


1. A magnetic toy, comprising, a lower support surface, an upper support surface mounted above said lower support surface and supported by a plurality of support posts, a plurality of bar magnets, rotatably attached to selected ones of said support posts and suspended between said upper and lower support surfaces, said bar magnets being free to rotate in a horizontal plane about their respective vertical axis, and a magnetic wand element adapted to be hand held by a user of said magnetic toy, said bar magnets being positioned such that the magnetic field of a pivotable bar magnet interacts with the magnetic field of each of the remaining pivotable bar magnets and with the magnetic field of said magnetic wand, whereby movement of said magnetic wand element in the vicinity of said plurality of bar magnets causes rotational movement of one or more of said plurality of bar magnets.

4,404,767
PLANT GROWING APPARATUS

Carlos W. Enrich, 11390 - 96th Ave., Delta, British Columbia, Canada V4C 2W5

Filed Nov. 3, 1981, Ser. No. 317,784
Int. Cl.³ A01G *25/00*
U.S. Cl. 47—67 13 Claims



1. A plant growing apparatus for growing plants therein, the apparatus having a tube containing a rooting medium, the tube having a side wall and open first and second ends, and being adaptable to provide clearance means to permit plants having roots immersed in the rooting medium to pass the side wall for growing outside the tube, the apparatus including:

(a) a first end member cooperating with the first end of the tube, the end member having an opening therein communicating with the rooting medium within the tube, and a reservoir portion adapted to cooperate with a water supply and to contain water at an essentially constant level,

(b) a second end member cooperating with the second end of the tube, the second end member having an opening therein communicating with the rooting medium within the tube,

(c) a rigid support member extending between the two end members to locate the end members in a fixed relationship relative to each other and to the support member,

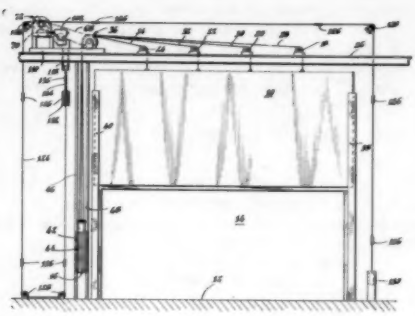
(d) the side wall of the tube being flexible and an integral flexible flange extending therefrom, the flange extending continuously between the end members along the length of the tube and being adapted to be positioned relative to the tube so as to be secured to the support member so as to restrain the tube against excessive movement relative to the support member and the end members,

(e) a wick means fitted within, so as to be essentially surrounded by, the rooting medium within the tube, and extending continuously between the end members, the wick means being disposed generally adjacent a side of the tube adjacent the flange, so as to be generally adjacent the support member, the wick means having opposite end portions cooperating with the first and second end members, one of the end portions communicating with the reservoir portion to supply water to the wick means, the wick means being capable of drawing water therealong by capillarity.

4,404,768
ARRANGEMENT FOR RELEASING A FIRE CURTAIN IN A THEATER

Nicholas G. Cristy, 31 Brighton Park, Rochester, N.Y. 14620

Filed May 22, 1981, Ser. No. 266,296
Int. Cl.³ E05F 15/20
U.S. Cl. 49—5 12 Claims



11. An improved safety curtain release apparatus for coupling a drive to a traction means to raise and to alternatively lower a theatre fire curtain, and, for automatically decoupling the drive upon occurrence of ambient conditions indicative of combustion to enable descent of the curtain, comprising:

a. an electrically energized drive means;

b. means for mechanically coupling said drive means to a fire curtain traction means for imparting rotary motion to the traction means to raise and lower the curtain when said drive means is energized and alternatively for restraining motion of said traction means when said drive means is deenergized;

c. said mechanical coupling means having a drive coupling gear means and a gear support means for alternatively engaging and disengaging said gear means to thereby respectively establish and interrupt mechanical coupling between said drive means and said traction means;

d. said gear support means comprising a rotatably mounted support body having a weight thereof, said gear means including a first gear mechanically coupled to said electric drive means and a second gear mounted to said support body for rotation therewith into and out of engagement with said first gear upon rotation of said support body,

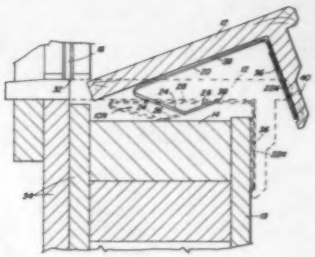
e. a combustion sensitive means for positioning said support body to establish engagement of said gear means and for enabling disengagement of said gear means upon occurrence of a relatively high ambient temperature indicative of combustion;

f. said positioning means including a cam follower mounted to said support body, a cam mounted to a stationary body and positioned in engagement with said cam follower for imparting motion to said support body between a first rotational position at which said gears are engaged and a second rotational position at which said gears are disengaged, said cam and cam follower maintained in engagement by the weight of said support body and members mounted thereto, an actuating arm coupled to said cam, combustion detection means coupled to said actuating arm for biasing said cam at said first position, and means for causing movement of said cam to said second position upon detection of combustion.

4,404,769
RODENT BARRIER FOR DOOR OVER RAILROAD TRACK

Jesse I. Casbeer, Jr., 7946 Cedel, Houston, Tex. 77055

Filed Dec. 29, 1980, Ser. No. 220,813
Int. Cl.³ E04H 9/16
U.S. Cl. 49—58 10 Claims



1. In a storage or shipping facility such as a warehouse having a railroad track extending into the warehouse through a warehouse door opening closable with a vertically movable warehouse door, apparatus for mounting with such warehouse door and with the railroad track mounted in the floor below such warehouse door for preventing the entry of rodents or other vermin, comprising:

channel members adapted to be mounted adjacent to the inside of each rail forming the railroad track directly below such a warehouse door in the closed position;

a floor section adapted to extend transversely of said warehouse opening along the line of closing of such warehouse door in the closed position to provide a surface area substantially flush with the top of such rails;

each of said channel members having a channel formed therein in cooperation with the inside of such adjacent rail, such channel extending linearly along the length of such rail; and

barrier plates mounted with said warehouse door and in vertical alignment with each of said channel members and having depending downwardly therefrom barrier detent portions having a configuration complementary to the configuration of said channels in said channel members such that said barrier detent portions of said barrier plates extend downwardly into a nested position in said channel member channels with such warehouse door in a closed position to prevent the entry of rodents or other vermin into said warehouse between the warehouse door and the rails.

4,404,770
SLIDING DOOR CONSTRUCTION FOR CLOSING AN OPENING IN A WALL

Jan J. G. Markus, Krimpen aan den IJssel, Netherlands, assignor to Markus Heretische Deuren B.V., Netherlands

Filed May 5, 1981, Ser. No. 260,751
Claims priority, application Netherlands, Aug. 21, 1980, 8004733
Int. Cl.³ E05D 15/56
U.S. Cl. 49—235 10 Claims

1. A sliding door construction for closing an opening in a wall, which door construction comprises:

(a) a door;

(b) a guide rail having a longitudinal V-shaped portion;

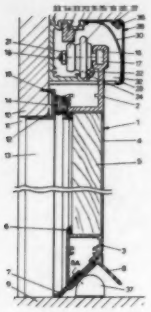
(c) a plurality of rollers carried by the upper edge of the door and disposed in the V-shaped portion for supporting the door on the guide rail for sliding movement along a plane parallel to and spaced from the wall;

(d) the V-shaped portion including recesses for engaging the

rollers to move the door downwardly and towards the wall into a closed position;

(e) the upper edge of the door including a first C-shaped slot;

(f) a plurality of bolts, each bolt including a shaft portion and a head portion, with the head portions being disposed in the first C-shaped slot and the rollers being rotatably mounted on the shaft portions;



(g) at least one ball bearing carried by the upper edge of the door; and

(h) means carried by the guide rail and engageable by the ball bearing for arresting the sliding movement of the door.

4,404,771

ROLLER ASSEMBLY FOR SLIDING CLOSURES

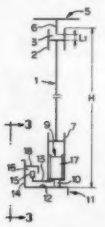
Yasushi Murase; Tosiyuki Kanegae; Hideaki Mitsuzawa, and Tosiyuki Tatsumi, all of Isehara, Japan, assignors to The Nippon Aluminum Mfg. Co., Ltd., Osaka; Nippon Alumi Jutaku-Kenzai Kogyo Co., Ltd., Kanagawa, both of, Japan; The Nippon Aluminum Mfg. Co., Ltd., Osaka and Nippon Alumi Jutaku-Kenzai Kogyo Co., Ltd., both of, Japan

Filed Feb. 9, 1982, Ser. No. 347,357

Claims priority, application Japan, Feb. 17, 1981, 56-22426

Int. Cl.³ E05D *13/02*

U.S. Cl. 49—425 **11 Claims**



1. In a sliding closure which is mounted on a structure defining an opening and which moves toward and transversely to a plane in which said opening lies for moving a portion of said closure in a direction toward said plane, a roller assembly which is to be disposed at least one at the lower portion of said structure for being moved in rotation on a substantially flat surface situated on a lower frame of said structure, being built into a step-like form, said roller assembly comprising:

a roller body;

an inner housing having a first rotation axis for rotatably retaining said roller body;

an outer housing attached to said closure for accommodating said inner housing therein so as to be rotatable about a pivotal second axis which is located at a separate position from, and is parallel to, said first axis;

a biasing means anchored between said inner housing and said outer housing for biasing said inner housing rotatably about said second axis such that at least a part of said roller body can be exposed outside from a lower opening of said outer housing; and

an engagement arm means which is vertically movable according to the rotational movement of said inner housing about said second axis and is thereby capable of preventing said closure from getting out of the structure by means of being engaged, when it is ascended, with a guide groove which is formed on a vertical wall portion of said steplike form along the longitudinal direction thereof.

4,404,772

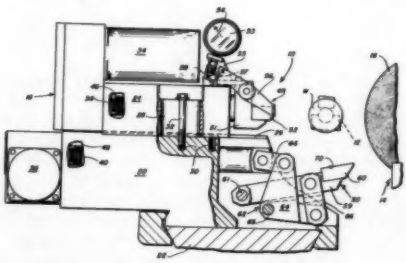
CYLINDRICAL GRINDING MACHINE

Glenn M. Snyder, Waynesboro, Pa., assignor to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Sep. 14, 1981, Ser. No. 301,725

Int. Cl.³ B24B *5/04*

U.S. Cl. 51—105 R **1 Claim**



1. A cylindrical grinding machine comprising

means for supporting and rotating a workpiece about a selected axis,

wheelhead assembly means selectively displaceable transverse to said axis including a rotatable grinding wheel for effecting stock removal from the surface of the rotating workpiece,

workrest assembly means including

jaw means having a workpiece engaging shoe, and

means for selectively displacing said jaw means for opposing the deflective force exerted by said grinding wheel on the rotating workpiece as it is machined, and

means for monitoring the wear of said jaw means including

indicator means mounted on said workrest jaw including a visually observable needle,

control arm means pivotally secured to said workrest jaw means having a first workpiece engaging end and a second end operatively associated with said indicator means,

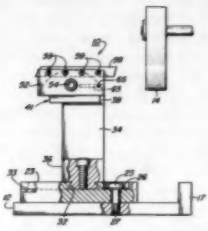
said control arm means having a first position whereat said control arm first end leads said workrest shoe and a second position whereat said control arm first end is flush with said workrest shoe, and

means for biasing said control arm means towards said first position for maintaining said control arm first end in constant tracking engagement with the surface of a rotating workpiece whereby jaw means wear will be indicated by the oscillation of said needle and the degree of wear will be indicated by the magnitude of such oscillation.

4,404,773
TOOL GRINDING FIXTURE

Richard L. Gauger, 1N050 Coolidge Ave., West Chicago, Ill. 60185

Filed May 4, 1981, Ser. No. 259,840
Int. Cl.³ B24B 3/34
U.S. Cl. 51—218 A 9 Claims



1. A grinding fixture for holding a tool bit during a grinding operation in which the tool bit is moved against a rotating grinding wheel, comprising in combination,

a base plate adapted to be mounted to the chuck of a grinding machine,

a pivot plate resting on said base plate and pivotably connected to said base plate for pivotal movement about a vertical axis,

said pivot plate having a rectilinear guideway in its upper face, the longitudinal axis of said guideway being displaced from said vertical axis,

an upstanding tool post mounted on said pivot plate and having a guide surface complimentary to and mating with said guideway for slidable movement on said pivot plate

a tool holder assembly including a first part pivotably mounted to said tool post for adjustable pivotal movement about a first horizontal axis, and

a tool bit holding block mounted to said first part of said tool holder for pivotal movement about a second horizontal axis which is orthogonal to the vertical plane containing said first horizontal axis,

said rectilinear guideway extending at an angle of forty-five degrees relative to said first and second horizontal axes,

whereby pivotal movement of said pivot plate about said vertical axis causes a tool bit mounted to said tool bit holding block to orbit around said vertical axis.

4,404,774
GRINDING MACHINE WITH A METHOD FOR SECURING DIMENSIONAL ACCURACY

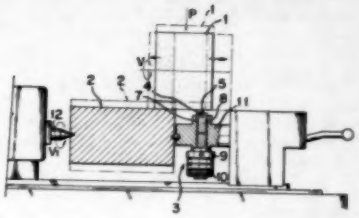
Yamanaka Sadao, Chigasaki, Japan, assignor to Nippon Thompson, Co., Ltd., Tokyo, Japan

Division of Ser. No. 877,762, Feb. 14, 1978, abandoned. This application Sep. 3, 1981, Ser. No. 299,162
Claims priority, application Japan, Feb. 15, 1977, 52-15968
Int. Cl.³ B24B 53/00
U.S. Cl. 51—325 1 Claim

1. In a rotary type surface grinding machine having a cylindrical grinding wheel rotatable in one direction about the axis of the cylinder, a workpiece opposedly disposed against the circumferential grinding surface of said grinding wheel and rotatable at such a rate of rotation so as to produce a relative motion with respect to said grinding wheel and to thus provide an effective grinding function, said grinding wheel and said workpiece being relatively feedable toward and away from each other, said grinding wheel and said workpiece being relatively feedable in a direction with respect to each other parallel to the axis of the cylinder, the method for securing a desired dimensional accuracy in the finish grinding of said workpiece without any possibility of error resulting from the stopping or adjustment of the grinding machine during the grinding operation comprising the steps of:

(a) supporting a diamond cutter means adjacent to but laterally displayed from the workpiece in a selected finish depth-of-grind position relative to the grinding surface of the grinding wheel with the diamond cutter means generally opposing the direction of feed of the grinding wheel toward said workpiece;

(b) moving the grinding wheel laterally over first the diamond cutter means and then the workpiece in a single continuing movement;



(c) incrementally feeding the grinding wheel towards the workpiece and toward the diamond cutter as the grinding wheel passes over both the workpiece and the diamond cutter means until desired finish grind has been completed, the dressing of the grinding wheel by the diamond cutter means on each lateral movement preventing excessive grinding of the workpiece during the grinding operation of that lateral movement so that the grinding operation can be completed without any stoppage or feed adjustment of the grinding machine.

4,404,775
RAIN GUTTER DEVICES

Robert J. Demartini, 3500 Canter La., Raleigh, N.C. 27604

Continuation-in-part of Ser. No. 198,830, Oct. 20, 1980, abandoned. This application Oct. 14, 1981, Ser. No. 310,838
Int. Cl.³ E04D 13/04
U.S. Cl. 52—12 41 Claims

1. A roof on a structure and a water control device for use in association with a gutter which is positioned at the edge of said roof and forms a trough described by an elongated bottom, a rear wall extending upward from said bottom along the side thereof closest to said structure, and a front wall extending upward from said bottom along the side thereof farthest from said structure, which device comprises a continuous main body that has an upper edge region and has a lower region that is substantially arcuate in cross-section, and is adapted for affixation at the edge region of said roof with the axis described by the arcuate portion of said lower region substantially parallel to the long axis of said gutter, with said arcuate portion extending beyond the front wall of said gutter, and with the lowest portion of said region positioned above the trough formed by the front wall, bottom and rear wall of said gutter,

said device being mounted on the upper surface of said roof

with a portion at least of the under-surface of the part thereof which is first encountered by water traversing said roof in substantially continuous contact with said upper surface of said roof, and said device including flow governing means for causing the kinetic energy of water traversing said device to be less, substantially entirely throughout the region of said arcuate section, than the forces acting counterdirectionally thereto induced by the surface tension of said water,

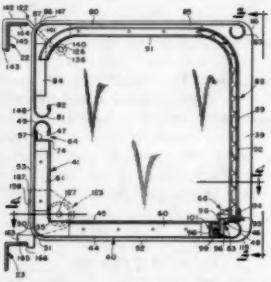
whereby said water will be caused substantially entirely to follow the contour of the upper surface of said arcuate portion of said lower region into said gutter, while debris associated with said water is substantially jettisoned off of said device without passing into said gutter.

4,404,776

HANGING COMPONENTS FOR SPACE DIVIDER SYSTEM

Douglas C. Ball, Ste-Anne-de-Bellevue; William S. Stumpf, and Gary R. Ludwig, both of Kitchner, all of Canada, assignors to Hauserman Ltd., Waterloo, Canada

Filed Jan. 21, 1981, Ser. No. 226,755
Int. Cl.³ B66B *9/00*
U.S. Cl. 52—29 **26 Claims**



1. A hanging component for an interior space dividing system comprising horizontally spaced vertical panels, each panel being formed of spaced plates, means within said panels at the upper and lower rear corners for hanging said component on such space dividing system, and supports for said means within said plates, said supports being pivot collars fixed to the interior of one plate and secured by fasteners to the other and also serving to secure said plates together.

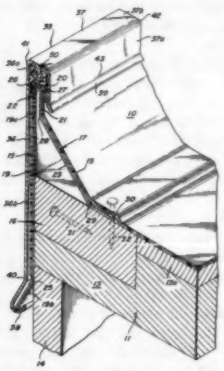
4,404,777

CONJOINT FACIA, HOOD AND WATER DAM

Ted E. Lolley, and Randolph W. Driggers, both of Tucker, Ga., assignors to MM Systems Corporation, Tucker, Ga.

Filed Jul. 31, 1981, Ser. No. 289,086
Int. Cl.³ F04D *13/15*
U.S. Cl. 52—60 **17 Claims**

1. In a conjoint facia, hood and water dam, the combination which includes; dam and first engagable means comprising, dam means having longitudinal ridge structure which includes upwardly extending laterally opposite forward and rearward sides, and said dam means adapted to be on a roof deck of a building and installed adjacent to a wall of said building for sustaining said ridge structure in a substantially fixed position above said roof deck and supporting sheet roofing having the latter lead from said roof deck at the rear of said dam means onto said ridge structure, and first engagable means adapted to be in a position adjacent to said building wall and below said ridge structure; facia and hood means comprising at least one facia and hood member, said facia and hood member including hood structure for covering said sheet roofing on said ridge structure and said hood structure comprising downwardly extending forward and rearward laterally opposite walls, and facia means to be disposed frontally of said dam means and said wall of said building and said facia means having second engagable means, said first and second engagable means together including restraining means to be engaged by upward movement of said facia and hood member for maintaining said facia means horizontally laterally restrained and said first engagable means comprising means for detaining said facia and hood member against movement in an upward direction relatively to said dam and first engagable means; and clamp and biasing means including resilient clamp means comprising counteractive presser means and bight means interconnecting said counter-active presser means, for said counter-active presser means, with said bight means disposed across said ridge structure and said clamp means resiliently sprung, to hold said clamp means clamped against said sheet roofing on said ridge structure and against said upwardly extending laterally opposite sides of said ridge structure having said sheet roofing disposed between said clamp means and said ridge structure, and resilient biasing means for being inside said hood structure to abut against said hood structure and be pressed downwardly against said clamp means while said sheet roofing is clamped by said clamp means against said ridge structure having said bight means disposed across said ridge structure and said sheet roofing disposed between said clamp means and said ridge structure; said facia and hood member, to be installed, initially having said hood structure covering said clamp and biasing



means, and said sheet roofing clamped by said clamp means against said ridge structure, with said bight means being disposed across said ridge structure and said sheet roofing being disposed between said clamp means and said ridge structure and said downwardly extending walls of said hood structure being laterally outside said upwardly extending laterally opposite sides of said ridge structure, and said facia and hood member thereafter being downwardly moved relatively to said dam and first engagable means for said restraining means to be aligned for being engaged having said resilient biasing means inside said hood structure and pressed downwardly against said clamp means and urging said clamp means to remain in place with said bight means disposed across said ridge structure and said clamp means clamping said sheet roofing against said ridge structure and said sheet roofing being disposed between said clamp means and said ridge structure and having said biasing means reactively move said facia and hood member upward relative to said dam and first engagable means to engage said restraining means and have said upward movement of said facia and hood member be stopped by said detaining means, with said restraining means thereafter still being engaged and said biasing means still pressing said clamp means downwardly and resiliently urging said facia and hood member in an upward direction, and with said hood structure still covering said sheet roofing on said ridge structure and said

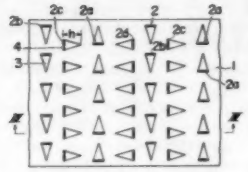
laterally opposite downwardly extending walls of said hood structure still being laterally outside said upwardly extending laterally opposite sides of said ridge structure and said clamp and biasing means.

4,404,778

METAL STRIP FOR PREVENTING INVASION

Chuji Ushimaru, Tokyo, Japan, assignor to Decol Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1981, Ser. No. 254,130
Int. Cl.³ E04B *1/72*
U.S. Cl. 52—101 **5 Claims**



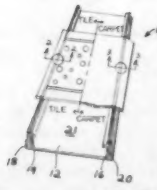
1. A metal strip for preventing invasion comprising a metal strip having a surface formed with a multiplicity of V-shaped projections extending from said surface substantially perpendicular thereto and positioned close to one another, whereby a force acting on said projections is distributed uniformly thereon, said projections **2** comprise four kinds of projections each lying in a row transversely of said strip **1**, and provided alternately to one another longitudinally of said strip **1**, said rows being equally spaced apart from one another, said projections being substantially equally spaced apart from one another in each row, two of said four kinds of projections, **2***a* and **2***b*, being separated from each other by another kind of projections, and having each a base extending in parallel to the longitudinal edges of said strip **1**, the other two kinds of projections **2***c* and **2***d* each having a base which is perpendicular to said longitudinal edges of said strip, each of said projection **2***a* having its base located substantially in a line in which the bases of said projections **2***c* and **2***d* lie, said projections **2***a* and **2***b* being formed by two kinds of oppositely directed cuts in said strip **1**, while the other projections **2***c* and **2***d* are likewise formed by two kinds of oppositely directed cuts in said strip.

4,404,779

TRENCHDUCT CONSTRUCTION HAVING ADJUSTABLE LID-SUPPORTING MEANS

L. Owen Calhoun, Richmond Hill, and Michael A. Murray, Toronto, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Filed Apr. 16, 1981, Ser. No. 254,880
Claims priority, application Canada, Apr. 10, 1981, 375261
Int. Cl.³ E04B *5/48*; E04F *17/08, 19/08*
U.S. Cl. 52—126.2 **6 Claims**



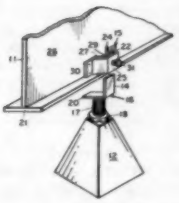
2. A trenchduct for internally receiving electric wires and cables comprising an uncoated galvanized steel base, means forming uncoated galvanized steel side walls along opposite flanges of said base and secured to said flanges to define an open space for receiving electric service therebetween, threaded means operatively secured to said flanges, vertically adjustable uncoated galvanized steel lid-support side wall means slideably engageable with said side walls and operatively defined in a lateral position relatively to said side walls, said lid-support side wall means comprising integral Z-cross section members each having a vertical section with a continuous flat surface substantially flush with a respective side wall for slideable engagement therebetween, a second section of each Z-cross section member projecting laterally above the confines of the open space formed by said side walls and base to receive the wires and cables, a third section of each Z-cross section member comprising a continuous transverse flange disposed outside the confines of said trenchduct and extending away from the respective side wall and including threaded openings therein, and a continuous plate of uncoated galvanized steel welded to said vertical section to form a lid receiving pocket therewith, said threaded means threadedly received through threaded openings in a respective transverse flange to effect vertically adjustable movement of said lid-support side wall means, and a plurality of removable lids disposed over the open end of said trenchduct at floor level and carried by the section of said lid carrying side wall means projecting laterally above said trenchduct open space, each of said Z-cross section members forming a continuous barrier enclosing the separation between the respective side wall and removable lids and thereby preventing concrete pour from entering said open space.

4,404,780

SUPPORT SYSTEM FOR RESTRAINING LATERAL MOVEMENT OF PIER-MOUNTED BUILDING

Martin Josephson, 718-27 Sycamore Ave., Vista, Calif. 92083

Filed Mar. 16, 1981, Ser. No. 244,208
Int. Cl.³ E04D *15/00*; E04G *21/00*
U.S. Cl. 52—126.7 **8 Claims**



1. In a system wherein a building having I-beams secured to the bottom of the building is supported by piers positioned beneath the I-beams, a system for restraining the building from moving laterally from the piers, comprising

a plurality of tongues secured to and extending vertically from the tops of a corresponding plurality of the piers; and

a corresponding plurality of socket members defining horizontally enclosed vertical sockets secured to the I-beams for receiving the vertically extending tongues for restraining lateral movement of the building from the piers.

4,404,781

MUD-SILL ANCHOR

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Dec. 12, 1980, Ser. No. 215,730
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—295 **8 Claims**

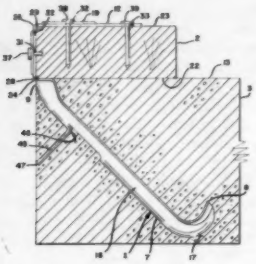
1. A singleside sheetmetal mudsill anchor for anchoring a wood mudsill plate to a concrete slab foundation comprising:

a. a concrete slab foundation having a perimeter;

b. a nailable form board member having an inner face temporarily placed in contact with a portion of said perimeter of said concrete slab foundation;

c. said anchor includes an embedded leg having a distal end embedded at an angle to the top of said slab and positioned downwardly within said slab foundation and inwardly from said slab perimeter and having an upper end positioned in contact with said inner face of said form board;

d. said anchor having a first mudsill attachment arm integrally connected to said upper end of said leg and extending above and outwardly from said form board and outside said perimeter of said concrete slab foundation wherein the plane of said arm is generally parallel to the top surface of said foundation;



e. said anchor having a second mudsill attachment arm integrally connected to said upper end of said leg and extending above and outwardly from said form board and outside said perimeter of said concrete slab foundation in generally the same plane as said first arm and at an angle of substantially less than 180° thereto;

f. a wood mudsill member positioned on said concrete slab perimeter edge when said concrete hardens;

g. said first and second mudsill attachment arms have a selected length for bending over said mudsill member from the same side of said mudsill and then over a portion of the top of said mudsill member; and

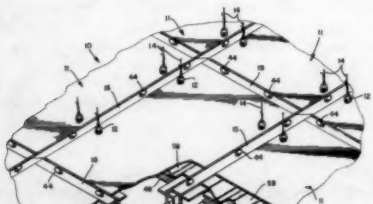
h. fastener means connecting said first and second arms to the top side of said mudsill member.

4,404,782

SUSPENDED MODULAR FLOOR ASSEMBLY

Virgil R. Williams, 2055 Webb Jin House Rd., Snellville, Ga. 30278, and James M. Williams, Jr., 2980 Payton Rd., NE., Atlanta, Ga. 30345

Filed Aug. 21, 1980, Ser. No. 180,137
Int. Cl.³ E04B *5/52, 5/58*
U.S. Cl. 52—475 **6 Claims**



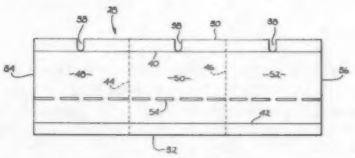
1. A suspended modular floor assembly for suspension from the truss structure of a roof of an industrial building, said floor assembly comprising a plurality of modules of similar size and shape and in abutment with one another at their edges, each said module comprising parallel side beams and parallel end beams each joined at their ends to one another and forming a peripheral rectangular frame, said side and end beams each constructed of similar cross-sectional shape with an upright web extending from top to bottom of and along the length of the beam, spaced upper and lower parallel flange members extending from one side of said web inwardly of the frame, the upper surface of said upper flange and the lower surface of said lower flange each being formed with a ridge with a recessed step surface extending to the side edge of each of said upper and lower flanges, and a tongue and groove formed on the other side of said web and extending outwardly of the frame with the tongue positioned over the groove for one side beam and one end beam and with the groove positioned over the tongue for the other side beam and the other end beam, said tongue comprising a closed box formation with said web and including an upper wall and a lower wall each connected at one edge to said web and an outer wall connected at its edges to said upper and lower walls, a plurality of elongated cross braces extending parallel to one another and connected at their ends to the lower flange members of the side beams, a corrugated support sheet positioned over said cross braces with the folds of its corrugations extending across the lengths of and engaging said cross braces, said corrugated support sheet being joined at its opposite edges to and overlying the recessed step surfaces of the upper flange of said side beams, a flat sheet member positioned over said corrugated support sheet and joined at its edges to and overlying the recessed step surfaces of the upper flange of said side beams, and hanger bolts extending through said upper and lower flange members of the beams of said rectangular frame, said bolts including connection means positioned over the beams for connection to a suspension line or the like.

4,404,783

MULTI PURPOSE ROOF PIECE

Bennie Freiborg, 4536 Indiana Ave., La Canada, Calif. 91011

Filed Nov. 17, 1980, Ser. No. 207,357
Int. Cl.³ E04D *1/20*
U.S. Cl. 52—518 **7 Claims**



1. An asphalt composition roofing piece of generally rectangular shape comprising a layer of asphalt saturated felt having a layer of rock granules applied to one side thereof and having a first end, a second end, a first edge and a second edge and further comprising:

a first foldable portion integral with said roofing piece and coupled thereto by a first hinge means having a hinge axis parallel to said first edge;

a second foldable portion integral with said roofing piece and coupled thereto by a second hinge means having a hinge axis parallel to said second edge;

at least one line of decreased structural integrity extending from said first edge to said second edge and lying perpendicular thereto and dividing said roofing piece into a plurality of equally sized parts;

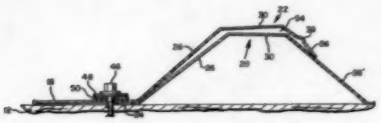
each equally sized part being provided with a notch extending from said first edge to approximately the hinge axis of said first hinge means and placed approximately at the midpoint of the first edge of each such equally sized part.

4,404,784

ANTISIPHON LAP JOINT FOR BUILDING SHEETS

Kenneth G. Gorman, Dallas, and Richard A. Marx, Salem, both of Oreg., assignors to Valley Rolling Mills, Inc., Salem, Oreg.

Filed Nov. 12, 1981, Ser. No. 320,186
Int. Cl.³ E04D 1/34, 3/30
U.S. Cl. 52—534 12 Claims



1. A lap joint construction for forming a tight weatherproof juncture between partially overlapping adjacent building sheets for roofing and the like, comprising:

(a) a lapped member including a rib extending along the entire extent of the juncture, said rib including a pair of upwardly-converging sloping sidewalls interconnected by a table;

(b) an overlapping member including an inner section having a shape which is congruent with the shape of a portion of said lapped member, a sealing lip arranged to resiliently separate the entire extent of said overlapping member from said lapped member when said overlapping member is urged toward said lapped member, and an intermediate strengthening bead interfacing said sealing lip with the remainder of said overlapping member; and

(c) fastening means for tightly securing said lapped and said overlapping member to an underlying structure and for urging said overlapping member toward said lapped member;

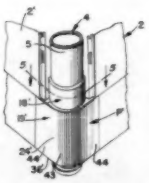
(d) said fastening means being located on the sheet apart from said lapped and overlapping members.

4,404,785

POST COVER PLATE

Richard W. McCracken, Youngstown; Melvin A. Textoris, Struthers, and Philip J. Williams, Poland, all of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Jan. 23, 1981, Ser. No. 228,704
Int. Cl.³ H02G 3/00; E04F 19/04
U.S. Cl. 52—290 12 Claims



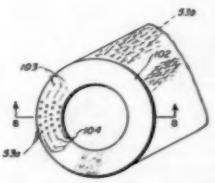
1. A partition assembly having panels provided with side edges attached to support posts having a bottom, said panels having a bottom, support assemblies disposed beneath said post bottoms engageable with an underlying surface to maintain said post bottoms and panel bottoms elevated above said underlying surface to define a bottom space therebetween, one said post attached to one said panel comprising an end-most post in said partition assembly, removable panel cover plates extending beneath said panel bottoms to enclose said bottom space beneath said panels, said panel cover plates having end edges extending laterally to a point short of said post support assemblies, a removable post cover plate adapted to mask that portion of said bottom space from each said post bottom to said underlying surface, said post cover plate including an upper section having a top edge disposed above said post bottom, said post cover plate upper section enveloping a majority of the peripheral extent of said post adjacent its bottom, a lower section extending below said upper section and overlying said support assembly, said lower section provided with opposite lateral edges, joining means on said lateral edges engageable with two said panel cover plate end edges to retain said post cover plate in said masking position, said lower section including a central curved portion defining an arc of substantially 180° and bounded by two straight portions having said joining means thereon, said post including a cylindrical periphery and said post cover plate upper section including an arcuate inner surface having a radius substantially mating the radius of said post, and said upper section arcuate inner surface describing an arc of substantially 270°.

4,404,786

METHOD AND APPARATUS FOR MAKING REINFORCED CONCRETE PRODUCTS

Philip L. Rotondo, 8 Watson Dr., Simsbury, Conn. 06070, and Thomas J. Rotondo, Meadow La., Harwinton, Conn. 06791

Filed Jan. 10, 1980, Ser. No. 111,168
Int. Cl.³ E04C 5/01, 3/34
U.S. Cl. 52—659 12 Claims



1. A hollow structure having an annular wall comprised of concrete,

a plurality of discrete cut lengths of straight reinforcing wires embedded within said annular wall along the length of and in alignment with the axis of said structure,

said cut lengths of wire being at least ten inches in length,

said embedded lengths of wire being ordered and arranged in a plurality of radially spaced annular arrays with wires in an annular array circumferentially and axially spaced from one another, and

said annular arrays axially overlapping one another.

4,404,787

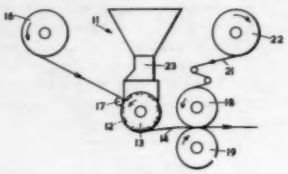
DENSITY CONTROL SYSTEM FOR TEA PACKAGING APPARATUS

Geoffrey Hazelwood, New Farnley, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Feb. 20, 1981, Ser. No. 236,332
Claims priority, application United Kingdom, Mar. 11, 1980, 8008189
Int. Cl.³ B65B 57/14
U.S. Cl. 53—502 3 Claims

1. A machine for packaging tea or other particulate solid material comprising a framework, a rotary dispensing drum mounted for rotation in the framework and having in its periphery a row of circumferentially spaced pockets, a hopper to contain the material to be packaged which is mounted in the framework and has a lower portion which contains a permanently open outlet through which the material flows by gravity into successive pockets in the drum as said drum rotates, the lower portion at least of the hopper being normally stationary but slidable when required in the framework in relation to the drum to vary the effective area of the outlet to the pockets and therefore the extent of filling of the pockets, means for imparting such sliding movement to said lower portion at least of the hopper, means for feeding a lower web of packaging material

into contact with the periphery of the drum so that it covers said pockets in succession after they have received material from said hopper through said outlet and leaves the bottom of the drum in a substantially horizontal run carrying spaced piles of material deposited on the web by gravity from successive



pockets in the drum, and means spaced laterally from said drum for superposing an upper web of packaging material on the lower web to cover the piles of material carried by and traveling with said lower web and sealing the webs together around the perimeter of each pile.

4,404,788

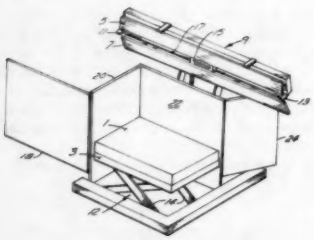
PACKAGING MACHINE

Jan T. Svenäng, Gothenburg, Sweden, assignor to Tex Innovation AB, Frölunda, Sweden

Filed Mar. 6, 1981, Ser. No. 241,347

Int. Cl.³ B65B *31/06*

U.S. Cl. 53—512 **13 Claims**



1. An apparatus for over-wrapping or bulk packaging of commodities on a pallet or the like supporting surface comprising a supporting surface on which said commodities are adapted to be over-wrapped or bulk packaged with a sealable flexible wrapping material having a vacuum valve therein, a movable enclosure surrounding the supporting surface and forming an open-topped chamber with said supporting surface, said chamber being adapted to receive said flexible packaging material therein, said movable enclosure being movable relative to said supporting surface to permit access to said supporting surface, means for gripping and engaging opposed portions of said flexible wrapping material, means for evacuating air from the flexible wrapping material after commodities have been inserted therein, and means for sealing the flexible wrapping material in said chamber to form a seal across the wrapping material, said means for sealing the flexible wrapping material being effective to seal the wrapping material prior to said means for evacuating air from the flexible material evacuating said air from said material through said vacuum valve means.

4,404,789

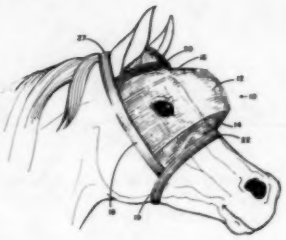
ANIMAL EYE PROTECTION DEVICE

Elizabeth R. Denning, 47715 Rainbow Canyon Rd., Fallbrook, Calif. 92028

Filed Aug. 10, 1981, Ser. No. 291,246

Int. Cl.³ B68C *5/00*; A61F *9/04*

U.S. Cl. 54—80 **11 Claims**



1. A device for protecting the eyes of an animal from inspects comprising:

a cover member having a pair of opposite side edges and comprising first and second panels and a third panel therebetween, said first panel having a top edge adapted for lying against and around a portion of an animal's forehead below the ears and above the eyes and a lower edge secured to said third panel, said second panel having a bottom edge adapted for lying against and around a portion of the animals's head below the eyes and an upper edge secured to said third panel, said third panel forming an arched cover over said animal's eyes and held in a spaced relation therefrom by said first and second panels, said third panel comprising a net-like material having spaces therein to provide visibility therethrough, and

means adapted for securing said cover member on said animal's head.

4,404,790

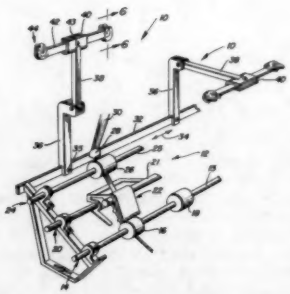
TRAVERSING CORE YARN GUIDE FOR SPINNING FRAMES

David C. Frederick, Gastonia, N.C., assignor to Hope Plastics Corporation, Gastonia, N.C.

Filed Jun. 11, 1981, Ser. No. 272,477

Int. Cl.³ D01H *13/04*

U.S. Cl. 57—12 **12 Claims**



1. A core yarn guide for use on a spinning frame or the like, said guide comprising:

yarn guide means for guiding said core yarn;

first support means to which said yarn guide means is fixedly secured; and

second support means to which said first support means is

fixedly secured, said second support means being selectively attachable to said spinning frame, said second support means including a first arm and a second arm pivotally attached to said first arm, said first arm being fixedly securable to said spinning frame and said first support means being fixedly securable to said second arm, said first support means including an elongated member substantially orthogonally aligned with respect to said second arm and being connected to said second arm at a point which is substatially centrally positioned along a length of said elongated member.

4,404,791

SPINNING MACHINE

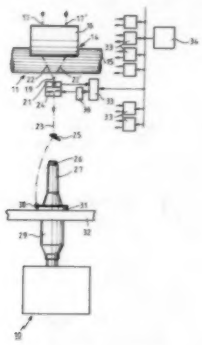
Horst Wolf, Albershausen, and Hermann Guttler, Uhingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,722

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028453

Int. Cl.³ D01H *13/16*

U.S. Cl. 57—80 **9 Claims**



1. A spinning machine for spinning yarns comprised of finite length fibers comprising a plurality of drawing means each of which draws two parallel, untwisted fiber strands, guide means for converging each of said two strands to provide a plurality of yarns, spindle means for imparting a twist to said yarns and winding said yarns, sensing means located between each drawing means and each guide means for continuously sensing a characteristic of the yarn which changes in the manner recognizable to said sensing means when the yarn is only being spun from one of the two fiber strands and interrupter means responsive to said sensing means for interrupting the spinning of the yarn upon breakage of one of said strands.

4,404,792

FRICTION SPINNING APPARATUS

Alan Parker, 7 Darvel Close, Breightmet, Bolton, Lancashire, and Douglas O. Clough, 26 Parkwood Dr., Rawtenstall, Rossendale, Lancashire, both of England

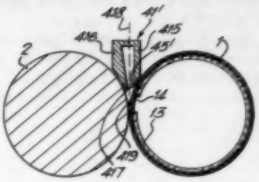
Filed Feb. 17, 1982, Ser. No. 349,541

Claims priority, application United Kingdom, Feb. 21, 1981, 8105573

Int. Cl.³ D01H *1/12, 7/892*

U.S. Cl. 57—401 **8 Claims**

1. In an apparatus for open-end spinning yarn of the type comprising two rotatable bodies each having a surface and arranged such that the surfaces define an elongate gap which narrows toward a line of closest approach of the surfaces, means for rotating one of the bodies in a direction so that the surface moves into the gap and means for moving the other body in a direction so that the surface moves out of the gap to twist fibres in the gap to form a yarn, means for withdrawing the yarn along the gap, and a fibre feed duct having an elongate mouth within the gap and arranged to feed fibres substantially



directly into the gap such that some fibres can fall directly on to the yarn, the improvement wherein the fibre feed duct is biassed to one side so as to tend to direct more of the fibres toward the surface which moves into the gap.

4,404,793

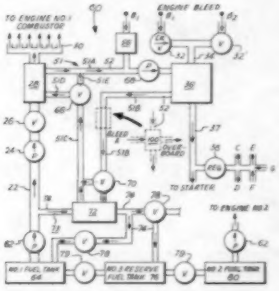
APPARATUS FOR IMPROVING THE FUEL EFFICIENCY OF A GAS TURBINE ENGINE

George A. Coffinberry, West Chester, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 20, 1980, Ser. No. 132,364

Int. Cl.³ F02C *6/08*

U.S. Cl. 60—39.07 **9 Claims**



1. An energy recovery system for a gas turbine of the type including means for supplying a flow of fuel thereto from at least one fuel tank and having at least one support system in which some of the pneumatic energy developed by the engine is made available to the support system, including first means for recovering at least some of the pneumatic thermal energy made available to but not utilized by the support system, second means for utilizing at least some of the energy recovered by the first means to heat the fuel substantially immediately prior to the consumption of the fuel by the engine, third means for utilizing at least some of the energy recovered by the first means to heat the fuel in the fuel tank, and fourth means for selectively utilizing the second and third means, which comprises:

a first liquid-to-liquid heat exchanger disposed to receive the flow of fuel substantially immediately prior to its consumption by the engine;

second air-to-liquid heat exchanger disposed to receive engine bleed air from the engine and to pass the engine bleed air to the support system;

third liquid-to-liquid heat exchanger means coupled to receive fuel from the fuel tank and to pass fuel therethrough and back to the fuel tank;

conduit means for coupling said first, second and third heat

exchangers, said conduit providing a first continuous loop between said first and second heat exchangers, a second continuous loop between said first, second and third heat exchangers, and a third continuous loop between said second and third heat exchangers;

pumping and pressurizing means for circulating a heat transfer medium through said conduit means; and

control valve means for controlling the flow of said heat transfer medium to said third heat exchanger.

4,404,794

TURBO-GENERATOR FOR A ROTARY WING HELICOPTER

Charles Dechaux, 4 Ave. de la Porte de Sevres, 75015 Paris, France

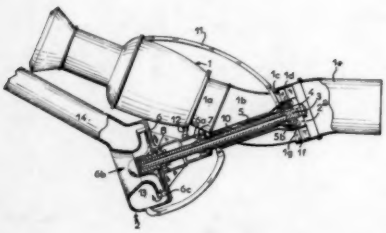
PCT No. PCT/FR80/00083, § 371 Date Jan. 16, 1981, § 102(e) Date Jan. 16, 1981, PCT Pub. No. WO80/02542, PCT Pub. Date Nov. 27, 1980

PCT Filed May 21, 1980, Ser. No. 230,945

Claims priority, application France, May 21, 1979, 79 12879

Int. Cl.³ F02C *3/10*

U.S. Cl. 60—39.161 **5 Claims**



1. A compressed air turbo-generator for supplying the reaction blades of the rotating wing of a helicopter, comprising

a turbo-reactor including a gas exhaust manifold, said turbo-reactor having a longitudinal axis;

a turbo-compressor having a longitudinal axis intersecting the longitudinal axis of said turbo-reactor at an actue angle, said turbo-compressor being located adjacent said turbo-reactor;

a driving turbine located within the gas exhaust manifold of said turbo-reactor, said turbine including a rotary wheel rotatable about the longitudinal axis of said turbo-compressor;

a shaft having one end secured to the rotary wheel of said driving turbine and the other end to said turbo-compressor for the rotation thereof;

a tubular member forming part of said turbo-compressor surrounding said shaft;

bearing means interposed between said tubular member and said shaft for rotation of said shaft within said tubular member, said bearing means including a rear ball bearing at the rotary wheel of said turbine; and

a hinged member pivotably coupled at one end to said turbo-reactor and the other end to said turbo-compressor, said hinged member permitting said turbo-compressor to be pivoted in a plane defined by said longitudinal axis about a point located in the region of the rotary wheel of said driving turbine.

4,404,795

METHOD OF AND APPARATUS FOR REDUCING EMITTED AMOUNT OF PARTICULATES CONTAINED IN EXHAUST GAS OF DIESEL ENGINE

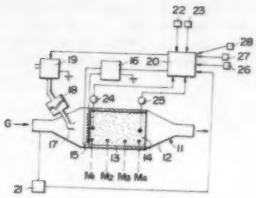
Kiyohiko Oishi, Susono; Yoshihiro Suzuki, Toyota; Kiyoshi Kobashi, Mishima; Shinichi Matsumoto, Toyota; Takashi Yoshida, Nagoya, and Takeshi Kogiso, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Jun. 12, 1981, Ser. No. 272,956

Claims priority, application Japan, Jun. 19, 1980, 55-83176

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—274 **13 Claims**



1. A method of reducing an emitted amount of particulates by introducing the exhaust gas from a diesel engine into a trapper and causing the particulates to adhere to a trapping member in said trapper, comprising the following steps in the sequence set forth:

detecting that the amount of the particulates which have adhered to said trapping member exceeds a predetermined value;

detecting that a temperature of said trapping member is within a range of self-burning temperature of the particulates relative to said adhering amount of the particulates;

heating an inlet part of said trapping member in said trapper to a range of igniting temperature of the particulates;

supplying secondary air to said trapper to ignite the particulates which have adhered to the inlet part of said trapping member;

and

stopping said heating of the inlet part of said trapping member;

whereby combustion of the particulates at the inlet part of said trapping member is propagated to the particulates which have adhered to an outlet part of said trapping member, to thereby regenerate said trapper.

4,404,796

REMOVAL OF PARTICULATES FROM DIESEL ENGINE EXHAUST GAS

Wallace R. Wade, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 3, 1982, Ser. No. 384,806

Int. Cl.³ F01N *3/02*

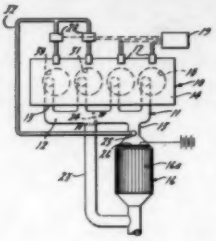
U.S. Cl. 60—274 **17 Claims**

1. A method for periodically oxidizing particulate matter trapped in and on an exhaust gas purifying device used in conjunction with a diesel engine having a plurality of combustion cylinders, each supplied with fuel for combustion, said purifying device having a fuel burning device associated therewith, the method comprising the steps of:

(a) diverting fuel normally delivered to selected combustion cylinders of said diesel engine to said fuel burning device and thereby deactivate the combustion operation of said selected cylinders;

(b) burning only said diverted fuel by said fuel burning

device to increase the temperature of the exhaust gas from the nonselected cylinders flowing through said purfiying



device to a level effective to combust said trapped particulate matter.

4,404,797

GAS TURBINE ENGINE POWERPLANT

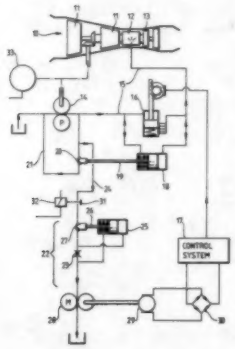
Charles E. G. Payne; Thomas I. Y. Jones, and Peter A. Dootson, all of Bristol, England, assignors to Rolls Royce Limited, London, England

Filed Nov. 20, 1981, Ser. No. 323,366

Claims priority, application United Kingdom, Dec. 10, 1980, 8039520

Int. Cl.³ F02C 7/22, 7/32

U.S. Cl. 60—39.281 3 Claims



1. Gas turbine engine powerplant comprising a gas turbine engine, a fuel pump connected to be driven by the engine and having a delivery duct connected to feed fuel to the engine, an electronic control system for varying the flow rate of fuel in the delivery duct thereby to vary the speed of the engine, a branch duct connected to the delivery duct and subject to pressure changes produced therein by said varying flow rate, changing means provided in the branch duct for changing the variable flow rate produced by said pressure changes into a constant flow rate, a hydraulic motor connected to be driven by said constant flow rate, an electric generator connected to be driven by the motor and connected to provide power for said control system.

4,404,798

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

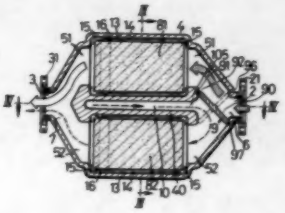
Shigeru Takagi, Anjo; Yukihisa Takeuchi, Aichi; Shigeru Kamiya, Chiryu; Masahiro Tomita, Anjo; Kiyohiko Oishi, Susono, and Kiyoshi Kobashi, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 7, 1981, Ser. No. 309,408

Claims priority, application Japan, Oct. 9, 1980, 55-141793

Int. Cl.³ F01N 3/02

U.S. Cl. 60—296 13 Claims



1. An exhaust gas cleaning device for collecting and burning particulates contained within exhaust gases discharged from an internal combustion engine, comprising:

a housing provided with an exhaust gas inlet chamber which is communicated with an exhaust gas inlet port, an exhaust gas outlet chamber which is communicated with an exhaust gas outlet port, and two independent exhaust gas flowing passages which are formed between said exhaust gas inlet chamber and said exhaust gas outlet chamber so as to be communicated therewith;

a pair of particulates collecting members for collecting said particulates, which are made of heat resistant material having air permeability;

each of said collecting members being disposed within each of said exhaust gas flowing passages;

an exhaust gas diverter valve which is disposed within said inlet chamber so as to be opposed to said exhaust gas inlet port for alternately directing the exhaust gas flowing from said exhaust gas inlet port to either one of said exhaust gas flowing passage while blocking the exhaust gases to the other flowing passage;

a heated air supplying means for burning off said particulates collected in said collecting member disposed in said other flowing passage;

said exhaust gas diverter valve being composed of a butterfly valve which is supported by a valve shaft in the central portion of said inlet chamber so as to turn by a predetermined degree clockwise and counterclockwise; and

said heated air supplying means comprising a heated air outlet port which opens into said exhaust gas inlet chamber so as to be opposed to said exhaust gas inlet port with said butterfly valve between.

4,404,799

PNEUMATIC TOOL WITH MUFFLER

Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

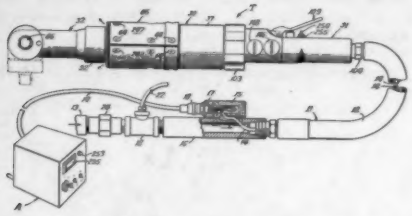
Division of Ser. No. 359,640, May 14, 1973, Pat. No. 3,920,062. This application Oct. 6, 1975, Ser. No. 620,035

Int. Cl.³ B23B 45/04; F01N 1/08

U.S. Cl. 60—370 10 Claims

1. In a pneumatic power tool including a tool body having a pneumatic motor mounted therein, said motor having at least one air inlet and one air outlet port therein, drive means in the body driven by the motor, the improvement of a sound attenuating exhaust air flow arrangement for said motor comprising at least one exhaust air discharge port in said body, said body

including a single annular wall, and means defining a tortuous path totally within the single annular wall through said tool body between said air outlet port of said motor and said exhaust air discharge port, said tortuous path being defined only by the



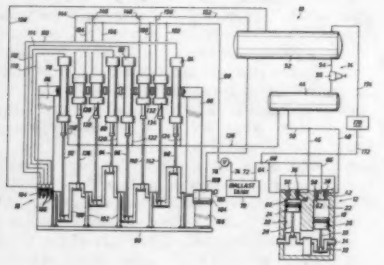
tool body and the drive means, said tortuous path being effective to reduce the sound level of the exhaust air flowing therethrough to a level such that no supplemental muffling is required.

4,404,800

GAS ENERGIZED ENGINE SYSTEM

Edison P. Penney, 3750 Underwood Blvd., Houston, Tex. 77025

Filed Sep. 16, 1980, Ser. No. 187,800
Int. Cl.³ F15B *11/06*
U.S. Cl. 60—370 **25 Claims**



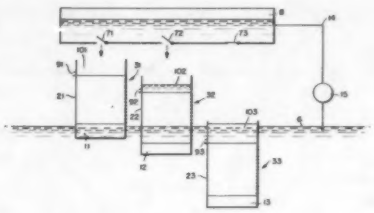
17. A gas energized engine system comprising:
(a) a piston type engine having compressed gas intake means and gas exhaust means;
(b) an operational pressure vessel containing gas for engine energization and being in communication with said intake means of said engine;
(c) pressure regulator means maintaining an operating pressure range within said operational pressure vessel;
(d) a high pressure vessel being in gas supplying connection with said pressure regulator means;
(e) pneumatic cylinder compressor means having a valve controlled intake in communication with said gas exhaust means of said engine and having a compressed gas discharge in communication with said high pressure vessel;
(f) pneumatic cylinder drive motor means having an inlet in communication with said high pressure vessel and an outlet in communication with said operational pressure vessel;
(g) timing valve means interposed between said high pressure vessel and said drive motor means, said timing valve means inducing sequential operation of said drive motor means;
(h) crank shaft means being rotatably mounted and having driving interconnection with said compressor means and driven interconnection with said drive motor means, said crank shaft means having controlling interconnection with said timing valve means; and
(i) auxiliary gas compressor means having an inlet in communication with said exhaust means of said engine and a discharge in communication with said high pressure vessel.

4,404,801

METHOD OF GENERATING ENERGY FROM DIFFERENT WATER LEVELS

Dieter Palm, Kopernikusstrasse 60, 6800 Manheim 1, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,511
Int. Cl.³ F03C *5/00*
U.S. Cl. 60—496 **8 Claims**



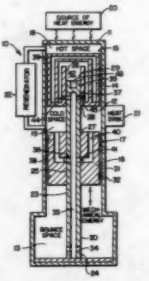
1. A method of generating energy, more particularly electrical energy, from differing water levels, comprising the steps of: filling a container resting upon a float while descending from an upper water level of the differing water levels through inwardly opening side flaps, wherein the outlet openings are closed during the filling; draining the container while rising through outlet openings opened upon reaching a desired filling level; and generating energy through movement of the container during the filling and draining of the container.

4,404,802

CENTER-PORTING AND BEARING SYSTEM FOR FREE-PISTON STIRLING ENGINES

William T. Beale, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed Sep. 14, 1981, Ser. No. 302,102
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **9 Claims**



1. In an improved free-piston Stirling engine provided with a housing which defines a work space and a reference space, a gas contained in said work space and said reference space, a displacer reciprocating in said work space and a reciprocating power piston in fluid communication with said work space, that improvement which comprises:
(a) an inner cylindrical piston wall extending axially through said power piston and defining a central bore in said piston;
(b) an inner cylindrical displacer wall extending from one

end of said displacer into a central portion thereof and defining a central opening in said displacer; and

(c) an elongated center rod fixed within said housing and providing an outer bearing surface upon which said inner cylindrical piston wall and said inner cylindrical displacer wall are slidingly engaged.

4,404,803

BRAKE UNIT WITH A HYDRAULIC BOOSTING DEVICE

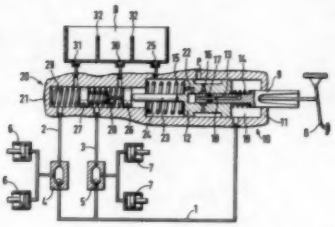
Helmut Steffes, Eschborn, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 18, 1981, Ser. No. 244,950

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016683

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **14 Claims**



1. A brake unit to generate a braking pressure in a vehicular brake system comprising:

a hydraulic booster unit connected to an auxiliary hydraulic boosting fluid source, said booster unit being controllable by a brake pedal via a control piston for driving a master brake cylinder unit to supply said braking pressure to wheel brake cylinders through at least one hydraulic line connected to an outlet of said master cylinder unit;

a bypass line connected to a boosting chamber of said booster unit subjected to auxiliary boosting fluid from said source upon actuation of said brake pedal to provide a preliminary feed of said boosting fluid to said wheel brake cylinders to overcome brake clearance; and

a changeover valve directly connected to said wheel brake cylinders, said hydraulic line and said bypass line responsive to said braking pressure and the pressure of said boosting fluid to connect said bypass line to and disconnect said hydraulic line from said wheel brake cylinders during said preliminary feed and to connect said hydraulic line to and disconnect said bypass line from said wheel brake cylinders after said brake clearance is overcome.

4,404,804

INTERNAL COMBUSTION ENGINE HAVING A TURBO-SUPERCHARGER AND A CATALYTIC EXHAUST GAS PURIFYING DEVICE

Tomoo Tadokoro; Masato Iwaki, and Haruo Okimoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

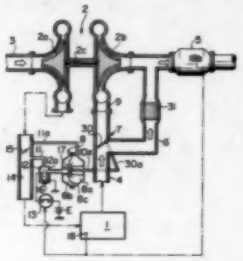
Filed Jan. 7, 1981, Ser. No. 223,165

Claims priority, application Japan, Jan. 10, 1980, 55-1822[U]; Feb. 15, 1980, 55-18891[U]; Feb. 20, 1980, 55-21575[U]

Int. Cl.³ F01N *5/04, 3/08;* **F02B** *37/00*

U.S. Cl. 60—602 **12 Claims**

1. An internal combustion engine including intake passage means and exhaust passage means, a turbo-supercharger comprised of exhaust gas turbine means provided in said exhaust gas passage means and compressor means provided in said intake passage means, first catalytic exhaust gas purifying means provided in said exhaust gas passage means downstream of the exhaust gas turbine means, bypass passage means having one end connected with said exhaust gas passage means upstream of the exhaust gas turbine means and the other end with the exhaust gas passage means between the exhaust gas turbine means and the first catalytic exhaust gas purifying means, valve means for controlling said bypass passage means, temperature responsive control means for actuating said valve means to open the bypass passage means when engine operating temperature is below a predetermined value so that at least a part of engine exhaust gas is passed through the bypass passage means to the first catalytic exhaust gas purifying means, and second catalytic exhaust gas purifying means provided in said bypass passage means and having a smaller capacity than said first catalytic exhaust gas purifying means.



4,404,805

METHOD OF AND SYSTEM FOR POWER GENERATION BY SUPERCHARGED INTERNAL COMBUSTION ENGINE

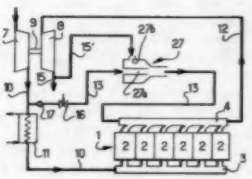
Remi Curtil, Montsoult, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint Denis, France

Filed Mar. 17, 1981, Ser. No. 244,624

Claims priority, application France, Mar. 21, 1980, 80 06439

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—606 **16 Claims**



9. A power generating system comprising: a piston-type internal combustion volumetric engine system, a supercharging air compressor system and an exhaust gas-driven turbo-motor system with mechanical and/or pneumatic couplings therebetween; a by-pass duct connecting the compressed air delivery pipe-line from said compressor system to the exhaust gas flow passage-way of said volumetric motor system after the outlet thereof from the working cylinders of said engine system and a device for recovering energy from the gases burnt within said volumetric engine system and for transferring the recovered energy to one part of the compressed air flow, a compressed air flow passage-way extending through said device which is inserted with its compressed air flow passage-way exclusively in said sole by-pass duct, characterized in that said energy recovery and transfer device consists of at least one ejector the impelled fluid suction pipe of which is branched in by-passing relationship off a gas outlet pipe-line of said turbo-motor system.

4,404,806

GAS TURBINE PRECHAMBER AND FUEL MANIFOLD STRUCTURE

Albert H. Bell, III, Birmingham, and James C. Hyde, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1981, Ser. No. 299,630
Int. Cl.³ F02C 7/22
U.S. Cl. 60—737 **3 Claims**

1. In a gas turbine engine having a pressurized air plenum, a combustor in said plenum, a source of fuel, a fuel control means remote from said combustor and connected to said fuel source, said fuel control means having a metering mode for metering fuel flow for combustion and a dump mode for purging fuel upon engine shut down to minimize fuel coking, and a generally cylindrical prechamber housing in said plenum defining a prechamber having an inlet exposed to said plenum and an outlet exposed to said combustor and a cylindrical surface therebetween, the improvement comprising, a plurality of delivery heads disposed on said prechamber housing with symmetrical spacing around said cylindrical surface and projecting therethrough into said prechamber, a plurality of identical fuel conduits in said plenum each having a first end and a second end and corresponding in number to the number of said delivery heads, means connecting said fuel conduit first ends to corresponding ones of said delivery heads, each of said fuel conduits wrapping around said prechamber housing and uniting with the others to form a bundle wherein said fuel conduit second ends terminate at successively greater distances from the end of said bundle, a fuel supply pipe having one end connected to said fuel control means and another end enveloping said fuel conduit bundle such that each of said fuel conduit second ends is disposed within said supply pipe, and means in said supply pipe defining a wall around said fuel conduit bundle downstream of the most distant of said fuel conduit second ends relative to the end of said fuel conduit bundle operative to prevent passage of fuel thereacross so that in said fuel control means metering mode equal fuel flow is induced in each of said fuel conduits and so that in said fuel control means dump mode fuel purge in each of said fuel conduits is rapid and complete.

4,404,807

GASIFIED ICE PROCESS AND PRODUCT

Valery B. Zemelman, Wilton, Conn., and Fredric Kleiner, Valley Cottage, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

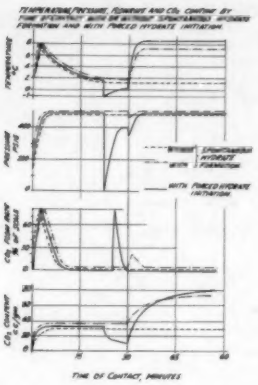
Filed Dec. 28, 1981, Ser. No. 334,846
Int. Cl.³ F25C 1/00
U.S. Cl. 62—1 **8 Claims**

1. An improved process for preparing a gasified ice characterized by a high gas content, prolonged storage stability suitable for commercial distribution in its frozen state, and a vigorous, uniform effervescence when placed in water, by contacting an aqueous liquid with a conditionally-stable-hydrate-forming gas under conditions of temperature, applied gas pressure and time effective to form a gas hydrate, followed by reducing the temperature of the aqueous liquid below its freezing point to entrap the gas hydrate in a matrix of frozen aqueous liquid, wherein the improvement is characterized in that:

(a) the aqueous liquid is initially contacted with said gas under conditions of temperature and applied gas pressure capable of forming the gas hydrate;

(b) the initial contact is maintained under applied pressure of said gas for a time effective to substantially equilibrate the total pressure in the system;

(c) the applied pressure of said gas is rapidly reduced to a degree effective to reduce the temperature of the aqueous liquid sufficiently to initiate formation of nuclei of water ice throughout said aqueous liquid;



(d) the applied pressure of said gas is increased to a level effective to initiate the formation of gas hydrate;

(e) the applied pressure of said gas and the temperature of said aqueous liquid are then maintained at levels and for a time effective to form gas hydrate about said nuclei of water ice; and

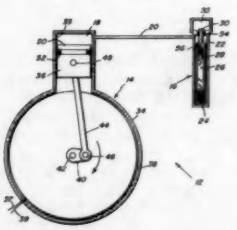
(f) the temperature of said aqueous liquid is reduced below its freezing point to entrap the gas hydrate in a matrix of frozen aqueous liquid.

4,404,808

CRYOGENIC REFRIGERATOR WITH NON-METALLIC REGENERATIVE HEAT EXCHANGER

Bruce R. Andeen, Acton, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Aug. 10, 1981, Ser. No. 291,517
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **12 Claims**



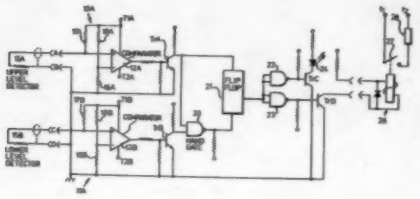
12. A refrigerator for operating at cryogenic temperatures comprising a compressor, a reciprocating displacer within a cold finger, the displacer being driven in reciprocating motion by the compressor through the medium of a compressable gas and a regenerative heat exchanger in the displacer in communication with the compressed gas comprising a pervious matrix of plastic material.

4,404,809

LIQUID NITROGEN LEVEL CONTROLLER

Arthur W. Johnson, Ottawa, and Howard R. Braun, Almonte, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 23, 1982, Ser. No. 401,374
Claims priority, application Canada, Aug. 20, 1981, 384251
Int. Cl.³ F17C 13/02
U.S. Cl. 62—49 7 Claims



1. Temperature sensitive liquid level controlling apparatus, comprising:

a container for holding a supply of a low temperature liquid;

first and second carbon resistors each having a resistance which changes in response to immersion in said liquid;

said first and second carbon resistors being positioned to determine upper and lower levels, respectively, of said liquid in said container;

first and second means for detecting the changes of resistance of said first and second carbon resistors;

said first and second change detecting means comprising first and second reference resistors and first and second means for comparing the resistances of said first and second carbon resistors with the resistances of said first and second reference resistors, respectively; and

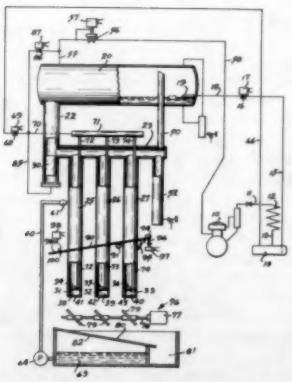
means response to the outputs of said first and second comparing means for controlling a flow of said liquid into said container.

4,404,810

METHOD OF MAKING ICE USING HOT GAS DEFROST

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Division of Ser. No. 242,219, Mar. 10, 1981, Pat. No. 4,324,109.
This application Dec. 28, 1981, Ser. No. 335,049
Int. Cl.³ F25C 5/10
U.S. Cl. 62—73 2 Claims



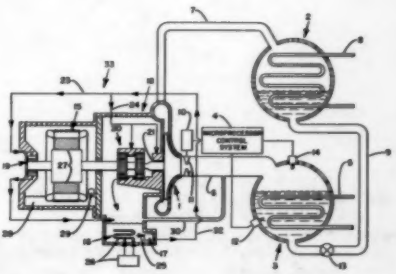
1. The method of producing ice in which vertical tube means is provided on which the ice is formed in heat exchange relation with refrigerant supplied to said vertical tube means through a supply line from a separator means connected to a suction means, said vertical tube means having a vapor return line to said separator means communicating with said suction means, comprising the steps of: flowing water over the vertical tube means and flooding the vertical tube means continuously with refrigerant in heat exchange relation with the water during the ice making phase, harvesting ice by stopping the flow of water, keeping the liquid refrigerant in the vertical tube means by preventing refrigerant flow through the supply line while continuing to maintain an open vapor return line between the vertical tube means and the separator means and maintaining such vertical tube means at a predetermined thawing temperature during the harvest time by regulating the pressure in the suction means and by introducing gaseous refrigerant at a temperature and pressure level exceeding the temperature and pressure level needed for thawing purposes into an area at the bottom of the tube means and flowing it upwardly through the tube means.

4,404,811

METHOD OF PREVENTING REFRIGERATION COMPRESSOR LUBRICATION PUMP CAVITATION

Gordon L. Mount, West Monroe, and Benjamin F. Hesler, Canastota, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,615
Int. Cl.³ F25B 43/02; G05D 23/32
U.S. Cl. 62—84 2 Claims



1. A method of regulating start-up operation, to prevent oil pump cavitation, of a hermetically sealed refrigeration system of the type wherein a lubricating oil reservoir is located in a housing filled with vaporous refrigerant at a pressure proportional to the refrigerant pressure in the refrigeration system evaporator, comprising:

measuring the pressure in the evaporator;

comparing the measured pressure in the evaporator to a pressure which corresponds to a desired predetermined rate of pressure drop for the evaporator;

generating an electrical signal when the pressure drop in the evaporator exceeds the predetermined rate; and

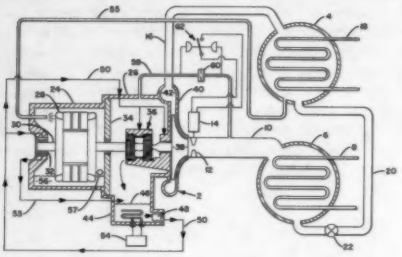
controlling the rate of pressure drop in the evaporator, in response to the generated electrical signals, so that the pressure drop in the evaporator approximately equals the predetermined rate.

4,404,812

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF A CENTRIFUGAL COMPRESSOR IN A REFRIGERATION SYSTEM

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,617
Int. Cl.³ F25B *43/02, 31/00*
U.S. Cl. 62—84 **7 Claims**



1. A compressor control for use in vapor compression refrigeration system for controlling the operation of a hermetic centrifugal compressor having a transmission enclosed in a housing said housing having an oil reservoir for lubricating the transmission and an atmosphere of refrigerant, said control comprising:

means to equalize the pressure between the compressor suction and the atmosphere of refrigerant in the housing,

means to detect a pressure differential between the compressor suction and the housing before equalization of the pressure in the housing occurs, and

means to throttle the suction to the compressor upon the detection of a predetermined pressure differential between the compressor suction and the housing.

4,404,813

DOOR MOUNTED ELECTRONIC HOUSING ASSEMBLY FOR A REFRIGERATOR

Stephen W. Paddock, Knight Township, Vanderburgh County, and Ralph Tate, Jr., Center Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 20, 1981, Ser. No. 255,672
Int. Cl.³ F25B *49/00*
U.S. Cl. 62—127 **23 Claims**

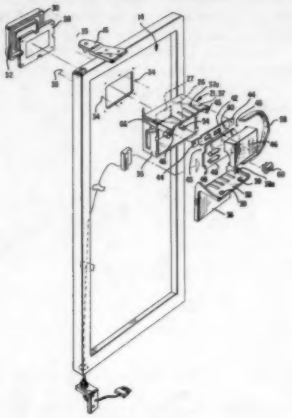
1. In a refrigeration apparatus having a cabinet defining a refrigerated space and including an insulated door for selectively closing said space, an electronic housing assembly comprising:

housing means including a first portion defining a circuit receiving space, said housing defining a front wall substantially closing the front of said circuit receiving space;

electronic circuit means including heat generating means disposed within said circuit receiving space;

heat transfer prevention means disposed within said housing for substantially retaining heat generated by said heat generating means within said housing; and

mounting means for mounting said housing means within insulation of said door, whereby sufficient heat is retained in said circuit receiving space by the substantial enclosure thereof by the heat transfer prevention means, the door



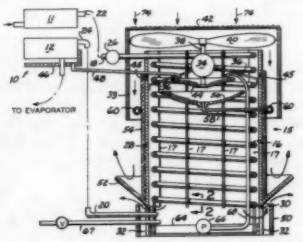
insulation, and the housing front wall to effectively prevent moisture condensation on said circuit means.

4,404,814

AUXILIARY CONDENSER COOLING TOOL FOR REFRIGERATED AIR CONDITIONERS

Albert W. Beasley, 2127 W. Sheridan, and Albert C. Beasley, 2624 NW. 1st, both of Oklahoma City, Okla. 73107

Filed Oct. 30, 1981, Ser. No. 316,695
Int. Cl.³ F28D *3/00*
U.S. Cl. 62—171 **3 Claims**



1. In an air conditioner unit of the self contained type having a primary condenser coil and a housing collecting condensed moisture, the improvement comprising:

an upright open end jacket;

a liquid containing sump within the depending end portion of said jacket;

a layer of moisture absorbent material surrounding said jacket intermediate its ends;

an endless tube surrounding said absorbent material adjacent its upper end,

said endless tube having a plurality of downwardly open apertures;

an auxiliary condenser coil carrying fluid to be condensed by cooling disposed adjacent the inner periphery of said jacket and communicating with said primary coil;

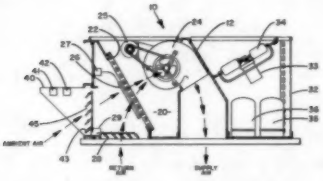
auxiliary fan and motor means including a motor drive shaft coaxially supported by the upper end portion of said jacket for generating a flow of ambient air across said auxiliary coil and through said jacket;

a dish coaxially supported by and angularly rotated with said drive shaft;
a tray coaxially supported below said dish;
pump and pipe means moving liquid contained by said sump to said dish;
first drain tube means connecting said housing with said dish;
second drain tube means connecting said tray with said endless tube; and,
fluid pressure sensing means connected with a source of electrical energy and interposed in the inlet end portion of said auxiliary coil for energizing said auxiliary fan and motor means in response to predetermined fluid pressure.

4,404,815
AIR CONDITIONING ECONOMIZER CONTROL METHOD AND APPARATUS

John D. Gilson, Bridgeport, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,799
Int. Cl.³ F25D *17/00*; G05D *23/00*
U.S. Cl. 62—180 **9 Claims**



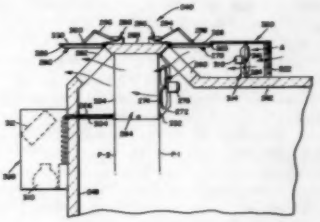
1. A control circuit for integrating economizer operation with operation of a compressor of an air conditioning system to effect cooling of an enclosure, said air conditioning system including a two stage thermostat for sensing a first stage cooling load and a second stage cooling load which comprises:
a second ambient thermostat set to close at a second threshhold temperature;
a first ambient thermostat set to close at a first threshhold temperature lower than the second threshhold temperature;
first circuit means for energizing the economizer to allow ambient air to enter the enclosure when the ambient air temperature is below the first threshhold temperature upon a first stage cooling load being detected;
second circuit means for energizing the economizer upon the ambient air temperature being above the first threshhold temperature and below the second threshhold temperature upon a first stage cooling load being detected and for energizing the compressor simultaneously with the economizer upon a second stage cooling load being detected; and
third circuit means for energizing the compressor upon a first stage cooling load being detected and the ambient temperature exceeding the second threshhold temperature.

4,404,816
MODULAR REFRIGERATION ASSEMBLY HAVING AIR DEFROST SYSTEM

Fayez F. Ibrahim, Niles, and Terry Wessel, Three Oaks, both of Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Apr. 14, 1981, Ser. No. 254,134
Int. Cl.³ F25D *21/12*
U.S. Cl. 62—282 **14 Claims**

1. In a refrigeration assembly in combination with a structure having side and top walls which encloses a mass of cooled air, and said assembly having at least one low temperature element arranged for contact by the refrigerated air, and an air moving means for circulating air into contact with said low temperature element; the improvement comprising:
an assembly housing for containing said air moving means and said low temperature element integrally formed at an elevated position in the top wall of said refrigeration assembly, ambient air inlet and outlet openings formed in said assembly housing, first and second substantially planar cover gates for blocking ambient air flow through said ambient air inlet and outlet openings during refrigeration cycles of operation, cover gates operating means operatively connected to said gates, a defrost control means operable in response to frost conditions to actuate said operating means for opening said cover gates upon th initiation of defrost cycles and to close said cover gates at the termination of the defrost cycles, said low temperature element affixed to the inner surface of said top wall and extending into the interior of said structure and surrounded by said mass of cooled air during a refrigeration

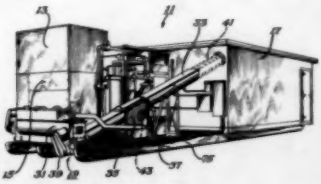


cycle, and said low temperature element having air outlet and inlet areas defining opposing sides thereof, said air outlet and inlet areas positioned in a straight line path passing substantially perpendicularly between said ambient air inlet opening and said ambient air outlet opening to enable the formation of a low resistance straight line ambient air flow path through said low temperature element and through said assembly during defrost cycles of operation, and said air outlet and inlet areas of said low temperature element positioned to intersect a straight line flow path of the refrigerated air band moving within said structure during a refrigeration cycle, said air moving means operative to circulate both refrigerated and ambient air through said air inlet and outlet areas of said low temperature element in both the refrigeration and the defrost cycles of operation, respectively.

4,404,817
SATELLITE ICE PLANT

Herman G. Cox, III, P.O. Box 2140, Fort Worth, Tex. 76113

Filed Feb. 25, 1982, Ser. No. 352,184
Int. Cl.³ F25C *5/18*
U.S. Cl. 62—320 **8 Claims**



7. A satellite ice plant operable by a single operator bagging ice, comprising:
a. ice making means for freezing ice;
b. comminution means for reducing the ice to crushed ice size for bagging; said comminution means disposed so as to take the ice from the ice making means;
c. refrigerated storage housing which is cooled below the

freezing point of said ice, said refrigerated storage housing having a bin for storing said ice;

d. conveyor means for conveying said ice to said refrigerated storage housing; said conveyor means including at least one screw conveyor having a snow remover means disposed at a location therealong for removing snow;

e. freeze-up prevention means for preventing freeze-up at the entrance of said conveyor means into said refrigerated storage housing; said freeze-up prevention means being disposed in communication with said conveyor means and adapted to prevent freeze-up of said conveyor means at its entrance into said refrigerated storage housing;

f. ice break up means for breaking up stored said ice for bagging;

g. second conveyor means interiorly of said refrigerated storage housing for conveying the ice that has been broken up to a bagging means;

h. control means operable automatically to supply said ice, breaking up of stored said ice, and convey the broken up ice to a bagging means responsive to need for ice thereat;

i. ice bagging means in said refrigerated storage housing and adapted to bag ice responsive to an operator;

such that one operator can operate said ice bagging means and the remainder of said satellite ice plant would automatically supply ice therefor; said control means including:

j. a bin level control so as to be responsive to the level of ice in said bin and energize when said ice is below a pre-determined level indicating inadequate ice and de-energized when said ice is above said pre-determined level indicating adequate ice;

k. ice movement control disposed so as to be responsive to the level of ice in a horizontal portion of said second conveyor means and to de-energize said ice moving means when there is adequate ice and to energize said ice moving means when there is inadequate ice; and

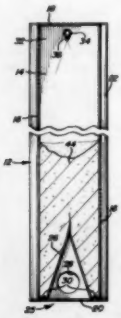
l. an ice bagging means control disposed so as to be responsive to the level of ice in said ice bagging means and to de-energize said second conveyor when said ice bagging means has adequate ice and to energize said second conveyor means when said ice bagging means has inadequate ice.

4,404,818

CO_2 SNOW COOLER WITH SNOW SPLITTING BOTTOM

Paul R. Franklin, Jr., P.O. Box 37978, Jacksonville, Fla. 32205

Filed Sep. 14, 1982, Ser. No. 417,993
Int. Cl.³ F25D *3/02*
U.S. Cl. 62—384 **9 Claims**



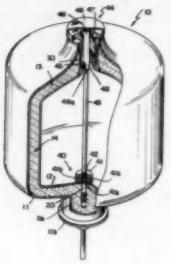
1. A CO_2 snow cooler including a vertically elongated hollow housing having a least generally vertical peripherally extending side walls, a bottom wall structure closing the lower portion of said housing, said bottom wall structure including means defining a sharply upwardly tapering central wedge body operative, upon downward gravity forces acting upon a quantity of CO_2 snow disposed within said housing above said wedge body to split the lower portion of said quantity of snow for wedging the snow laterally into surface to surface heat transfer relation with the inner surfaces of the lower portions of said side walls horizontally aligned with and opposing said wedge body.

4,404,819

VALVED CRYOGENIC DEWAR

Rex D. Leonard, Indianapolis, Ind., assignor to International Cryogenics, Inc., Indianapolis, Ind.

Filed Jul. 16, 1982, Ser. No. 398,745
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**



1. A cryogenic dewar, comprising

an inner container for cryogenic fluids, and an outer casing surrounding the inner container and being sealed to said inner container to define a vacuum space therebetween, said vacuum space carrying thermal insulation to impede the transfer of heat from the surrounding atmosphere to the inner container,

first means forming an opening between the inner container and the outer casing at the bottom of the dewar and second means forming an opening between the inner container and the outer casing at the top of the dewar,

a valve at the bottom of the inner container to control the flow of cryogenic fluid through said first means,

said valve including a valve body forming at least one passageway from the inner container to said first means and a valve seat therebetween, and including a valve closure adapted to engage and seal the valve seat,

a rod having the valve closure at its lower end and being supported by the body within the inner container,

a valve actuator for said rod carried in said second means, said valve actuator being adapted to engage the rod at its upper end and to operate said valve closure and to be movable from said second means.

4,404,820

COLD COMPRESS

John W. Romaine, 58897 County Rd. 115, Goshen, Ind. 46526

Filed Jan. 29, 1982, Ser. No. 343,790
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—530 **9 Claims**

1. A cold compress, comprising:

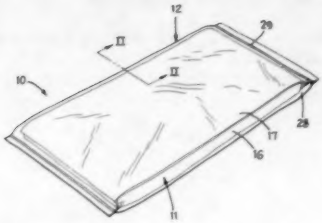
a thin, soft, flexible pad means which is deformable to conform to a portion of a human or animal body, said pad means maintaining its soft and flexible properties over a temperature range from about 0° F. to about 100° F.;

a tough, flexible envelope sealingly enclosing said pad means;

said pad means being of a laminated structure and including a gel pad and a thermal insulator pad fixed to and overlying one of the enlarged side surfaces of the gel pad;

said gel pad being substantially solid, self-supporting, and nonflowable throughout the aforesaid temperature range;

said gel pad comprising a padlike piece of flexible, open-cell, synthetic resin foam, the inner communicating open cells of said foam being substantially filled with a coagulated gel of polyvinyl alcohol and containing included water and a freeze-point depressant; and



said insulator pad comprising a thin sheetlike piece of flexible, porous insulator material, said gel and some of the moisture from said gel pad penetrating said porous insulator material whereby said insulator pad becomes attached to said gel pad.

4,404,821

YARN FEEDER AND CHANGER UNIT

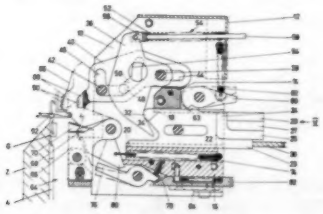
Bertram Johnson, Braunstone, and Arthur R. Smith, Leicester, both of England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Filed Sep. 5, 1980, Ser. No. 184,295

Claims priority, application United Kingdom, Sep. 28, 1979, 7933686

Int. Cl.³ D04B *15/60*

U.S. Cl. 66—139 **12 Claims**



1. In a knitting machine having a circular array of needles axially reciprocable in tricks in at least one needle cylinder, a yarn feeder and changer unit comprising:

a fixed support frame alongside the needle cylinder or cylinders;

first and second parallel mounting pins rigidly mounted on said support frame;

a number of yarn feeders mounted on the said mounting pins in side-by-side relationship, each having a yarn guide eye and each being movable on the said mounting pins between a first position in which the said yarn guide eye is in a yarn trapping position and a second position in which the said yarn guide eye is in a yarn feeding position, said first mounting pin passing through a first elongate slot in each yarn feeder and said second mounting pin passing through a second elongate slot in each yarn feeder; and

actuating means including a linearly reciprocable slide member for each yarn feeder, whereby linear movement of each slide member in an actuating direction causes the associated yarn feeder to move from its first position to its second position in two separate and defined successive movements of which the first is a pivotal movement of the yarn feeder about the said first mounting pin and the second is a sliding movement of the yarn feeder over the said first and second mounting pins, said actuating means for each yarn feeder comprises said slide member and a lever plate, the lever plate being pivotally mounted on said first mounting pin and having cam means engaging the associated yarn feeder, and the slide member bearing on the lever plate so that linear movement of each slide member in the said actuating direction causes a pivotal movement of the associated lever plate and yarn feeder together about said first mounting pin to complete the said first feeder movement, followed by a continued pivotal movement of said lever plate about said first mounting pin to cam the yarn feeder in a sliding movement over said first and second mounting pins to complete the said second feeder movement.

4,404,822

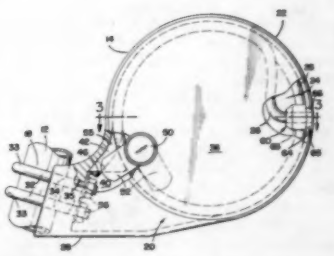
PRE-COILED CABLE-LOCK DEVICE

Leonard O. Green, 922 S. Birch St., Santa Ana, Calif. 92701

Filed May 18, 1981, Ser. No. 265,041

Int. Cl.³ B62H *5/00*; E05B *71/00, 73/00*

U.S. Cl. 70—233 **7 Claims**



1. A lock device for two-wheel vehicles, comprising:

a housing having an annular wall including receiving means, and a rear wall defining a drum-like compartment;

a projecting neck member integrally formed as part of said housing and adapted to be fixedly secured to the frame structure of the two-wheeled vehicle;

means attached to said neck member for securing said housing to said frame structure adjacent at least one of the wheels thereof;

a pre-coiled cable for storage in said drum-like compartment and having sufficient length to form an enlarged loop when extended from said compartment, one end of said pre-coiled cable being fixedly secured within said compartment and the opposite free end thereof being removably mounted within said receiving means of said annular wall;

keeper means attached to said free end of said cable and adapted to be removably mounted within said annular wall;

a removable cover adapted to be lockably secured to said housing, in order to cover said compartment; and

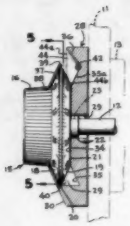
locking means mounted to said cover for locking said cover to said housing.

4,404,823

VIEW LIMITING DIAL AND RING STRUCTURE FOR COMBINATION LOCKS AND THE LIKE

Harry C. Miller, Nicholasville, and Walter R. Evans, Lancaster, both of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Dec. 5, 1980, Ser. No. 213,734
Int. Cl.³ E05B *63/00, 1/00*
U.S. Cl. 70—333 A **17 Claims**



1. A combination lock dial and ring assembly for combination locks and the like for limited range top reading of the dial indicia by reflected light rays only, comprising a rotatable dial member having a circular dial portion and a knob formation projecting forwardly therefrom, the dial portion including a rearwardly facing annular indicia bearing surface adjacent said periphery having rearwardly facing dial graduations and mirror image reversed dial numerals thereon, said annular indicia bearing surface defining a frustro-conical annulus outwardly bounded by the circular periphery of the dial portion and lying in a rearwardly convergent cone of revolution concentric with the center axis of the dial inclined at substantially the same angle to said center axis as the cone of revolution of said mirror surface and in the opposite direction, and a dial ring having a forwardly facing dial receiving cylindrical well encircled by an integral shielding surround ring formation over a sufficient extent to exclude observation of the dial graduations and numerals laterally and below the dial portion and having an interruption of limited circumferential extend providing a sight opening for observation of the dial graduations and numerals in a restricted observation zone generally above and vertically aligned with the axis of the dial member, the rear surface of the dial receiving well having an arcuate light-reflecting mirror surface carried on and conforming to the shape of said rear surface at least spanning the arcuate extent of said sight opening positioned to reflect light rays from said dial graduations and numerals along reflection ray paths extending along upwardly and forwardly inclined paths to said restricted observation zone for visual observation of the rearwardly facing numerals and dial graduations confronting the mirror surface.

4,404,824

SIDE-BAR LOCK

Thomas F. Hennessy, Bristol, Conn., assignor to Lori Corporation, Southington, Conn.

Filed Feb. 5, 1981, Ser. No. 231,777
Int. Cl.³ E05B *27/06*
U.S. Cl. 70—364 A **19 Claims**

1. A cylinder lock operated by a key having detents of differing depths provided within its opposing surfaces comprising:

cylinder housing means;

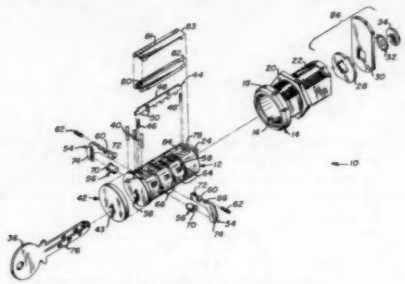
key plug means rotatably mounted within said cylinder housing means, said key plug means being provided with a keyway;

at least one tumbler means, said tumbler means being reciprocally mounted in said key plug means, said tumbler means being normally biased into said keyway, said tumbler means being directed out of said keyway upon engagement with a detented key, said tumbler means position being determined by the depth of the key detent with which it is engaged;

at least one bar means, said bar means being slidably mounted in said key plug, said bar means being biased in a first direction, said bar means being in contact with said tumbler means, said bar means being moved in a second direction opposite to said first direction by said tumbler means when said tumbler means engages the detented key;

first biasing means for biasing said tumbler means in said first direction;

fence means, said fence means being reciprocally mounted in said key plug means, said fence means being biased in a third direction generally transverse to said first direction to engage said cylinder housing means and prevent the



rotation of said key plug means, said fence means contacting a portion of said bar means which prevents said fence means from moving in a fourth direction opposite to said third direction when the lock is in the locked condition;

true gate means, said true gate means being provided in said bar means portion, said true gate means being placed in alignment with said fence means when said bar means is moved to the unlocked position by reception of said plug means in a key detent of proper depth, said true gate means receiving said fence means and allowing said fence means to move in said fourth direction and disengage from said cylinder housing means; and

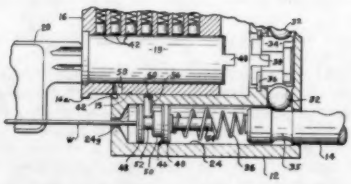
second biasing means for biasing said fence means in said third direction.

4,404,825

PADLOCK HAVING A REPLACEABLE CYLINDER

David Dixon, Monroe, and William A. Krupicka, Charlotte, both of N.C., assignors to Scovill Inc., Waterbury, Conn.

Filed May 12, 1981, Ser. No. 263,036
Int. Cl.³ E05B *9/06*
U.S. Cl. 70—368 **12 Claims**



1. A changeable-cylinder padlock comprising a body having a large central opening formed in one end thereof, a cylinder disposed in the opening, the other end of the body being formed with a pair of spaced bores, a shackle, one of said bores receiving the heel and the other the toe of the shackle, the heel-receiving bore being parallel to and spaced from the

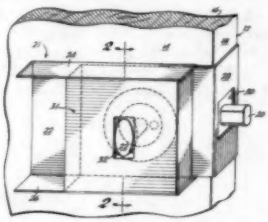
cylinder opening, bolt means inside the housing associated with the cylinder selectively to hold the shackle in locked position, the heel bore extending well beyond the heel end of the shackle and being reduced at a shoulder to an access hole extending to the said one end of the body, the body being formed with a passage between the heel bore and the cylinder opening, pin means being reciprocably disposed in said passage and normally extending into an aperture in the cylinder thereby holding the cylinder in the body, spool-like stop means disposed in the heel bore and normally blocking the pin means for moving away from the cylinder, the height of the stop means in the heel bore when the lock is locked and the shackle down keeping the stop means in blocking position, but the stop being movable when the lock is open to permit the pin means to vacate said aperture in the cylinder and permit withdrawal of the cylinder.

4,404,826

KEEPER DEVICE FOR DOOR LOCK

Garrett W. Brill, 745 NE. 88 St., Miami, Fla. 33138

Filed Jun. 3, 1981, Ser. No. 269,839
Int. Cl.³ E05B *13/00*
U.S. Cl. 70—416 **2 Claims**



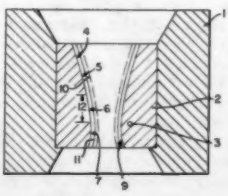
1. For a door having an outside and an inside main face and gripped with a bolt movable from the door side between the faces into and out of a locked position upon operation of an outside key or an inside operator knob, a keeper comprising a channel form member having an upper flange, a lower flange, and a longitudinally extending web, said longitudinally extending web being bent from the main plane of the web away from the channel members and including a cutout portion sized to accommodate the bolt of the door and a block sized to nest between the flanges and including a cutout to receive the operator and restrain movement of the bolt.

4,404,827

METHOD AND APPARATUS FOR DRAWING WIRE

Jaak S. Van den Sype, Scarsdale, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 10, 1981, Ser. No. 282,255
Int. Cl.³ B21C *9/00*
U.S. Cl. 72—41 **9 Claims**



1. In a die adapted for drawing wire and comprising a casing with a nib disposed centrally therein, said casing being comprised of a material having a high thermal conductivity,

(a) said casing including

(i) inlet and outlet means; and

(ii) at least one internal passage surrounding the nib and connected to the inlet and outlet means, the inlet and outlet means and the internal passage being constructed in such a manner that a fluid can pass into the inlet means, through the internal passage, and out of the outlet means; and

(b) said nib including a walled passage through which wire can be drawn, a portion of said walled passage being constructed in such a manner as to provide a working surface for the die,

the improvement comprising providing the internal passage with

(a) a total surface area for heat transfer of about 0.4 square inch to about 4 square inches; and

(b) a cross-sectional area of about 0.0001 square inch to about 0.01 square inch.

4,404,828

METHOD OF DRAWING A METAL WIRE AND LUBRICANT COMPOSITION THEREFOR

John Blachford, Westmount, Canada, assignor to H. L. Blachford Ltd/Ltee, Montreal, Canada

Filed Aug. 1, 1980, Ser. No. 174,652
Int. Cl.³ B21B *45/02*; C10M *7/10, 7/28, 7/44*
U.S. Cl. 72—42 **22 Claims**

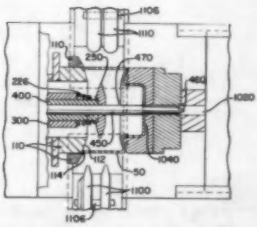
10. A method of drawing a metal wire comprising feeding a metal wire through a lubricant composition comprising a particulate lubricant and discrete pressure rupturable microcapsules having a liquid core, to form a coating of the composition on the wire, drawing the coated wire through a die effective to reduce the diameter of the wire, and allowing the microcapsules to rupture to release said liquid at the die, said liquid being a load carrying additive effective to enhance the wire drawing operation.

4,404,829

METHOD AND APPARATUS FOR THE MANUFACTURE OF PULLEYS

Vanco Dorakovski, 111 25th St., Massillon, Ohio 44646

Continuation of Ser. No. 110,943, Jan. 10, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,713
Int. Cl.³ B21D *22/14*
U.S. Cl. 72—84 **26 Claims**



1. A method for the manufacture of multiple groove pulleys comprising:

(a) inserting a pulley blank into a blank orientation device;

(b) removing the pulley blank from said blank orientation device using a blank loading device;

(c) positioning the pulley blank, on said blank loading device, in orientation between a tail stock assembly and a head stock assembly of an internal spin pulley manufacturing device;

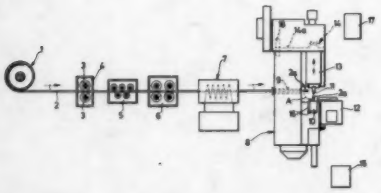
(d) extending a feeder plunger in a spin roller shaft from said head assembly;
(e) securing the pulley blank between said head stock assembly and said tail stock assembly;
(f) retracting said feeder plunger to within said spin roller shaft;
(g) removing said blank loading device;
(h) spinning said head stock assembly about a rotatable hollow drive shaft, said spinning revolving the pulley blank and said tail stock assembly;
(i) engaging at least one internal spin roller with the internal circumference of the pulley blank;
(k) sliding at least two external spin rollers and engaging said external spin rollers with the exterior circumference of the pulley blank;
(l) maintaining said internal spin roller engagement and maintaining said external spin roller engagement during said spinning of said head stock assembly and said securement of the pulley blank between said head stock assembly and said tail stock assembly until a pulley is produced by deformation from the pulley blank;
(m) aligning the axis of said spin roller shaft with the axis of said hollow drive shaft, thereby disengaging said internal spin rollers from the internal circumference of the pulley;
(n) sliding said external spin rollers from engagement with the exterior circumference of the pulley;
(o) extending said feeder plunger from said spin roller shaft to engage the pulley at its axis;
(p) inserting an electromagnetic removal disc on a pulley unloading device between said tail stock assembly and said head stock assembly;
(q) retracting said feeder plunger to within said spin roller shaft from the internal axis of the pulley; and
(r) removing said pulley by said electromagnetic removal disc.

4,404,830

METHOD AND APPARATUS FOR PRESSING PARTS FROM ROUND STOCK

Friedrich-Karl Koch, deceased, late of Krefeld, Fed. Rep. of Germany (by Annekathrin Koch, Klaus-Michael Koch, executors), assignor to L. Schuler GmbH, Goppingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 649,417, Jan. 15, 1976, abandoned. This application Mar. 26, 1982, Ser. No. 362,503
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501506
Int. Cl.³ B21B *37/04*
U.S. Cl. 72—128 **4 Claims**



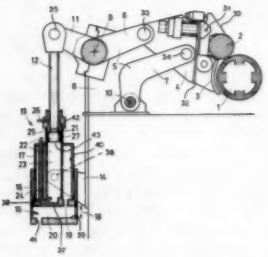
1. An apparatus for producing pressed parts to close tolerance from eutectic steel wire stock wound on a supply reel comprising:
means for drawing said wire stock from said supply reel followed by means for straightening said wire stock,
a press having a holding furnace, a shear station and pressing dies,
a wire stock heating furnace for heating said wire stock to a temperature above the cold forging temperature range and below the hot forging temperature range and with the semi-warm range of 600°–850° C.,
a wire stock feed mechanism consisting of two pairs of longitudinally spaced feed rollers disposed upline from said heating furnace for firmly gripping and intermittently pushing said wire stock while unheated through said heating furnace and into said holding furnace for maintaining the temperature of said wire stock within said semi-warm without handling of the heated wire stock,
means for maintaining the temperature of said pressing dies at at least about 150° C. for minimizing die wear and thermal differential with said wire stock, and
transfer means for transferring cut pieces of wire from said shear station to said pressing dies.

4,404,831

STRIP-GUIDE ASSEMBLY FOR A METAL STRIP COILER

Berthold Hild, Burbach-Wahlbach; Martin Braun, Kreuztal-Ferndorf, and Max Münker, Hilchenbach, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 283,004
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026524
Int. Cl.³ B21C *47/06*
U.S. Cl. 72—148 **4 Claims**

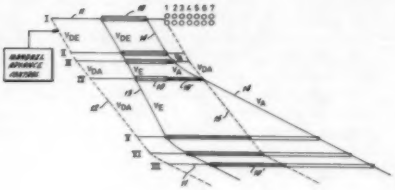


1. A positioning device for a strip-guide member, in combination with a strip-coiling mandrel, of a strip coiler, said device comprising:
a four-pivot linkage carrying said member and displaceable to shift said member toward and away from said mandrel; and
a pneumatic-hydraulic unit connected to said linkage, said unit comprising
pneumatic cylinder means including a pneumatic cylinder having a workpiece chamber and a stroke-limiting pneumatic piston, said pneumatic piston being hollow,
means forming a hydraulic cylinder within the interior of said hollow pneumatic piston and having a hydraulic piston connected to said linkage for displacing same,
means for independently hydraulically pressurizing said hydraulic cylinder and pneumatically pressurizing said pneumatic cylinder,
means defining a further chamber in said hollow pneumatic piston surrounding said hydraulic cylinder, and
means continuously communicating between said chambers whereby the combined volumes of said chambers form a pneumatic cushion.

4,404,832
OPERATING A ROLLING MILL WORKING ON SEAMLESS TUBING

Gerd Pfeiffer; Horst Biller, both of Mülheim; Manfred Bellmann, Breitscheid; Karl Oberem, Mülheim; Alfred Lampe, Willich, and Hermann-Josef Frentzen, Moechen-Gladbach, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 348,034
Claims priority, application Japan, Feb. 20, 1981, 54-24164
Int. Cl.³ B21B 17/02
U.S. Cl. 72—209 3 Claims



1. In a method of hot-rolling seamless hollows by means of a plurality of driven roll stands under utilization of an elongated cylindrical mandrel, comprising the steps of

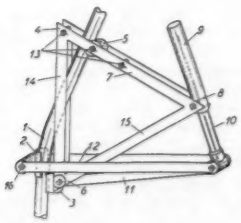
determining stretch values of at least a first one and a second one of said stands, λ_1 and λ_2; and

controlling the mandrel speed during rolling to be larger than $\lambda_1 \cdot V_E$ but smaller than $V_E[1+\lambda_1(2+\lambda_2)]/4$, wherein V_E is the actual entrance speed of the hollow at the first stand and upstream thereof.

4,404,833
DEVICE FOR STRAIGHTENING OF PIPES

Torkil K. Andersen, Jovavej 25, Kolding, Denmark

PCT No. PCT/DK81/00005, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02120, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 15, 1981, Ser. No. 305,632
Claims priority, application Denmark, Jan. 21, 1980, 232/80
Int. Cl.³ B21D 3/00
U.S. Cl. 72—216 7 Claims

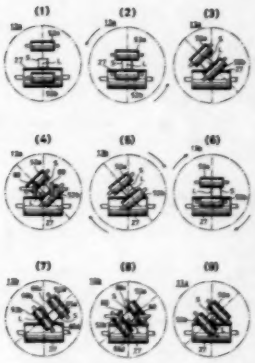


1. Device for straightening of bent, tubular road sign posts, characterized in that the device comprises a base (2, 3) in two parts to span a bent pipe (1) on one side of its bent portion, which base (2, 3) is connected to one end of at least one bar (11), the other end of which is pivotally fastened to a piston rod (10) in a working cylinder (9), which is pivotally fastened to a corner (8) of a triangular straightener (7, 14, 15), another corner (6) being pivotally fastened to one part of the base (3), and the side (7) opposite this corner (6) bearing a thrust roller (5) arranged to press against the other side of the bent portion of the pipe (1).

4,404,834
ROD SHAPED METAL ROLLING APPARATUS AND METHOD

Teruaki Tanaka, Aichi, Japan, assignor to Daido Tokushuko Kabushiki Kaisha, Japan

Filed Aug. 21, 1981, Ser. No. 294,874
Claims priority, application Japan, Aug. 27, 1980, 55-118707; Aug. 27, 1980, 55-118708; Nov. 7, 1980, 55-157416
Int. Cl.³ B21B 39/16, 39/20
U.S. Cl. 72—221 6 Claims



1. In a rolling apparatus comprising rolling means and a plurality of rollers arranged along a horizontal conveyor line to allow a material to be rolled to move thereon while supporting the material and having means disposed in the middle of said conveyor line for rolling the material having been conveyed along said conveyor line, and having means disposed on one side of the means for rolling for rotating the material during the process of a reciprocated conveyance thereof along said conveyor line, said means for rotating including:

(a) a framework construction so disposed that said conveyor line extends therethrough;

(b) a rotating frame connected to said framework construction rotatable about said conveyor line as central point of rotation thereof;

(c) a pair of support frames disposed in said rotating frame, having said central point of rotation of said rotating frame therebetween and movable relative to each other to vary the distance therebetween;

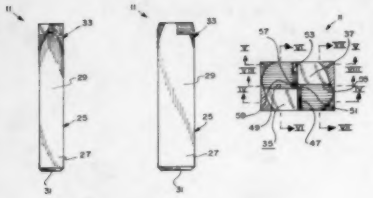
(d) a pair of work holders connected to said support frames, respectively, for taking hold of the material having been conveyed along said conveyor line;

(e) holding means disposed in close proximity to said work holders for moving said work holders to each other so that the distance between said work holders may be varied;

(f) each of said framework, said rotating frame, said support frames, said work holders and said holding means being axially aligned with said conveyor line; and

(g) further including work-path correcting means disposed between said rolling means and said means for rotating, said work-path correcting means comprising a pair of locating plates disposed with said conveyor line therebetween and means for moving each of said locating plates independently relative to said conveyor line so that the distance between said locating plates may be varied.

4,404,835
TOOL
Marvin E. Frith, Rte. 2, Box 40, Coffeeville, Miss. 38922
Filed Sep. 21, 1981, Ser. No. 304,327
Int. Cl.³ B21D *28/00, 39/02*
U.S. Cl. 72—325 **3 Claims**

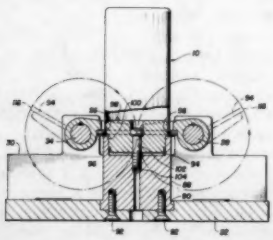


1. A tool for forming a pair of locking tabs in a piece of metal as it is hammered thereinto, said tool comprising:

(a) a body member having a first end and a second end, said first end of said body member including an anvil portion for being selectively struck with a hammer or the like;

(b) a head means for engaging said piece of metal, said head means including a first finger member having a first end attached to said second end of said body member and having a second end, said head means including a second finger member having a first end attached to said second end of said body member and having a second end, said first finger member having a first side wall and a second side wall, said first and second side walls of said first finger member joining one another to form a corner, said second finger member having a first side wall and a second side wall, said first and second side walls of said second finger member joining one another to form a corner, said corners of said first and second finger members being located diagonally from one another with at least a portion thereof abutting one another, said first side walls of said first and second members being substantially flat and lying substantially in the same plane extending in the direction of the longitudinal axis of said body member, and said second side walls of said first and second finger members curving upwardly from said second end of said body member.

4,404,836
METAL CONTAINER EDGE TRIMMING METHOD AND APPARATUS
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.
Filed Dec. 7, 1981, Ser. No. 327,802
Int. Cl.³ B21D *24/16*
U.S. Cl. 72—332 **27 Claims**



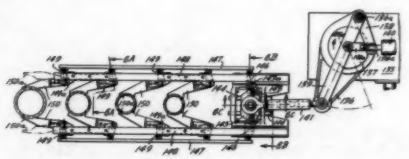
1. In a method of forming a one-piece metal can body having an outwardly directed closure attachment flange at its open end by initially deep-drawing a flat metal blank into a one-piece can body having an outwardly directed flange at its open end and subsequently trimming the excess metal from said outwardly directed flange leaving the closure attachment flange on the open end of the can body, the improvement comprising the steps of

supporting the open end of the drawn can body in position to be trimmed with the inner peripheral portion of the outwardly directed flange in abutting relation with an annular shoulder having a diameter, corresponding to the diameter of the closure attachment flange

supporting a plurality of first rotary cutters for rotations about spaced axes disposed in a plane perpendicular to the longitudinal axis of the can body, the first rotary cutters each having a concave arcuate cutting edge having a radius corresponding to the desired radius of the closure attachment flange, the arcuate cutting edges having a combined length substantially equal to the periphery of the closure attachment flange, and

driving said first rotary cutters for rotation around their respective axes to substantially simultaneously engage and trim the outwardly directed flange along a trim line defining the peripheral edge of the closure attachment flange.

4,404,837
PRESS TRANSFER BAR
Robert J. Allen, Daly City; Edward W. Blake, Orinda, both of Calif.; Manjeshwar S. Rao, Hoffman Estates, Ill., and Kurt L. Hahn, San Rafael, Calif., assignors to American Can Company, Greenwich, Conn.
Division of Ser. No. 56,704, Jul. 11, 1979, Pat. No. 4,373,370.
This application Nov. 1, 1982, Ser. No. 438,121
Int. Cl.³ B21D *72/00*
U.S. Cl. 72—349 **1 Claim**



1. A method for transferring can bodies within a progressive forming press which receives sheet stock in a horizontal plane and blanks and cups same in a first station, draws the cup in a second station, redraws and bottom profiles in a third station, trims the flange in a fourth station and separates scrap ring and can body in a fifth station including the following steps:

(a) carrying slightly beneath the horizontal plane four sets of opposed fingers each pivotally mounted, each upon an axis and each designed to cooperate with its partner and each shaped to conform to the semifinished can body and said axes being fixedly disposed on a chassis means and each axis carried normal to the horizontal plane and said chassis means mounted to reciprocate substantially within the horizontal plane;

(b) timing the reciprocations of said chassis means to be substantially simultaneous with the periodicity of the press stroke and in particular with the opening of the slide therein;

(c) supporting a pair of connecting rods for the finger sets on said chassis means to reciprocate approximately in the plane with said chassis means and in the same direction but relative thereto for simultaneously driving said opposing fingers about their respective axes from a first position where the can body grasping ends of each finger set are apart to a second position where said can body grasping ends of each finger set are together about a semifinished can body; and

(d) timing the maintenance of said first and second positions and the motion therebetween to the periodicity of the press stroke so when the slide therein is in its opening

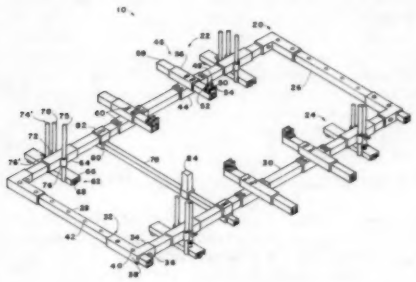
mode moving said grasping ends toward each other to grasp semifinished can bodies then holding same as said chassis means reciprocate to positions said bodies at the next adjacent station.

4,404,838

SYSTEM FOR STRAIGHTENING BENT AUTOMOBILE BODIES

Charles E. Hare, 23 Franklin Valley Cir., Baltimore, Md. 21136

Filed Jul. 23, 1981, Ser. No. 286,086
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—457 **3 Claims**



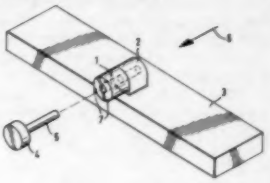
1. In a system for straightening bent automobile bodies and the like and having a frame (20) of generally rectangular proportions including means (62) for raising and lowering the frame and means (48) for clamping it to an automobile body, the improvement comprising: the frame (20) having as components: first and second side-assemblies (22, 24), each having first and second ends; means permitting the first and second side-assemblies to be independently moved to corresponding sides of an automobile body and clamped to the automobile body by said clamping means, including respective means (66) transverse to each of said first and second side-assemblies (22, 24) for holding the first and second side assemblies upright while being independently moved to a corresponding side of an automobile body and clamped to the automobile body by said clamping means (48), first and second end rails (26, 28), quick-attach means (32) for adjustably joining respective first and second ends of said side assemblies after said clamping to an automobile body; means (58) for extending the clamping means (48) inward of said frame, means (46) for adjusting the position of said means for extending; means permitting application of straightening forces to a car body inward through said clamping means (48) including the frame (20) being larger across than automobiles to be straightened using the frame; said means (66) for holding upright being a part of the means (62) for raising and lowering; each means (62) for raising and lowering including a said means for holding upright in the form of a base (66), roller means (68) on the base, a jack (74', 76') on the base and having a jacking connection (76') for raising and lowering the frame; each of said first and second side-assemblies including a respective side rail (30), and means (64) mounting said means for raising and lowering slidably along the side rails.

4,404,839

TESTING DEVICE FOR FORCE MEASURING APPARATUS

Erich Geisler, Polling, Fed. Rep. of Germany, assignor to Marker-Patentverwertungsgesellschaft mbH., Baar, Switzerland

Filed Feb. 6, 1981, Ser. No. 232,366
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004729
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 B **5 Claims**



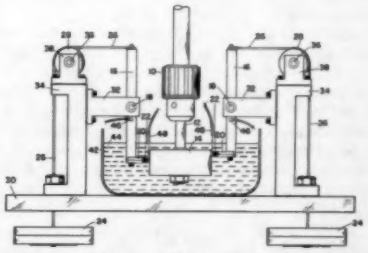
1. A testing device for force measuring apparatus, said testing device comprising:
base means;
a magnet fixed to said base means;
plate means of ferro magnetic material magnetically attracted to said magnet;
force engaging means attached to said plate means for receiving applied forces; and
spacing means for maintaining a uniform gap between said plate means and said magnet; wherein;
said force engaging means urges said plate means from said magnet on the application of force to said force engaging means.

4,404,840

DEVICE FOR EVALUATING ABRASIVE WEAR OF ELASTOMERIC O-RING MATERIALS

Bruce H. Burr, 10203 Sagedown La., Houston, Tex. 77089, and Kurt M. Marshek, 9701 Courtleigh Cir., Austin, Tex. 78759

Filed May 18, 1981, Ser. No. 264,687
Int. Cl.³ G01N *3/56*
U.S. Cl. 73—7 **8 Claims**



1. An apparatus for measuring and testing O-ring wear and dynamic coefficient of friction characteristics of an O-ring surface and the like, the apparatus comprising; coupling means to hold and selectively rotate a wear cylinder during the wear test; at least one vertical loading arm mounted to pivot on support means in said apparatus; a specimen holding assembly at the bottom of the loading arm which holds at least one segment of the O-ring; a dead weight connected to the top of the loading arm by means of a steel cable on pully means for maintaining the wear specimen against the wear cylinder; a container of abrasive test fluid for immerson of the test specimens and wear cylinder; strain gauges mounted on the vertical

loading arm which serve as a means for determining the friction force on the O-ring specimens; at least one thermocouple in the O-ring specimens for monitoring the temperature there of during the tests; a rough surface on the wear cylinder which tends to draw said abrasive test fluid into the interface between the wear cylinder and the O-ring segment causing wear involving the cylinder, the O-ring segment and the test fluid.

4,404,841

OPTICAL COMBUSTION SENSOR SYSTEM

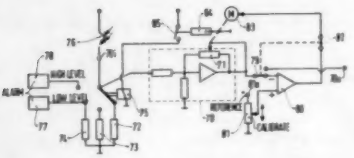
Horst Franke, Löchgau; Ernst Linder, Mühlacker; Winfried Moser, Markgröningen; Klaus Müller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,518

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112327

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **18 Claims**



1. Optical sensor system to obtain an optical signal representative of characteristics of combustion events in a combustion chamber, particularly a combustion chamber (**10**) of an internal combustion engine having

a tubular housing formed with means for securing the housing in a wall (**12**) defining at one side thereof said combustion chamber;

light pick-up means (**13**, **20**, **30**) retained in the housing and having a sensing end portion in optical communication with the combustion chamber at one end thereof;

light-responsive means (**76**) being coupled to the pick-up means;

and comprising, in accordance with the invention,

means (**15**, **16**; **23**, **24**, **28**, **29**; **35**; **53**, **56**, **57**) for applying reference light to the pick-up means;

and signal evaluation means (**70**, **80**, **91**) coupled to the light-responsive means and receiving both said reference light and the light generated as a consequence of a combustion process in the combustion chamber, and normalizing the sensed light derived from the combustion process with respect to the reference light to obtain an output representative of absolute light regardless of contamination of the light pick-up means upon continued exposure thereof to combustion processes or events.

4,404,842

LEAK DETECTOR FOR INTERMITTENT PRESSURE PIPE LINES

Joseph R. Mooney, 7780 Townsend Pl., New Orleans, La. 70126

Filed Apr. 15, 1982, Ser. No. 368,538

Int. Cl.³ G01M *3/08;* **G08B** *21/00*

U.S. Cl. 73—40.5 R **5 Claims**

1. A leak detector for intermittent pressure pipe lines comprising:

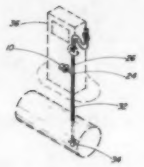
(a) battery means for energizing a low voltage power circuit;

(b) manually operable off-on switch means for energizing a low voltage power circuit;

(c) a pair of pressure sensitive switch means mounted in said intermittent pressure pipe line and connected in said power circuit to close at the upper and lower limits of a predetermined pressure drop in the lower third of said intermittent pressure pipe line's pressure range;

(d) timing circuit means connected across said power circuit and adapted to be energized by the closing of one of said pair of pressure sensitive switch means at said upper limit of said pressure drop for a predetermined time period;

(e) latching circuit means connected to said timing circuit means and across said power circuit for being energized during said predetermined time period to conduct; and



(f) alarm circuit means connected in parallel with said timing circuit means and to said power circuit and latching circuit means for being energized, through said latching circuit means when conducting, by the closing of the other of said pressure sensitive switch means at the lower limit of said predetermined pressure drop for indicating a leak when both pressure sensitive switch means are actuated to close during said predetermined time period of said timing circuit means.

4,404,843

CRYOGENIC STORAGE TANK LEAK DETECTION SYSTEM

Irvin D. Johnson, Englewood, Colo.; Gary M. Timlin, Kenai, Ak., and Robert D. Yuill, Yokohama, Japan, assignors to Marathon Oil Company, Findlay, Ohio

Filed Jul. 20, 1981, Ser. No. 284,756

Int. Cl.³ G01M *3/32*

U.S. Cl. 73—49.2 **15 Claims**

1. A system for detecting leaks in the barrier (**130**) separating the primary (**140**) and the secondary (**120**) insulation spaces disposed around a cryogenic storage tank (**10**), said system comprising:

means (**200**) for storing an inert gas,

first means (**120**) connected to said storing means (**200**) and to said primary insulation space (**140**) for supplying and maintaining said inert gas at a first predetermined pressure (P_{NP}) in said primary insulation space (**140**),

means (**230**) connected to said primary insulation space (**140**) for exhausting said inert gas from said primary insulation space (**140**) to maintain said first predetermined pressure (P_{NP}),

second means (**220**) connected to said storing means (**200**) and to said secondary insulation space (**120**) for supplying and maintaining said inert gas at a second predetermined pressure (P_{NS}) in said secondary insulation space (**120**),

means (**240**) connected to said secondary insulation space (**120**) for exhausting said inert gas from said secondary insulation space (**120**) to maintain said secondary predetermined pressure (P_{NS}), and

means (**250**) connected to said first supplying means (**210**) and to said primary insulation space exhausting means (**230**) for determining any primary flow difference between the total mass flow of said inert gas into and out

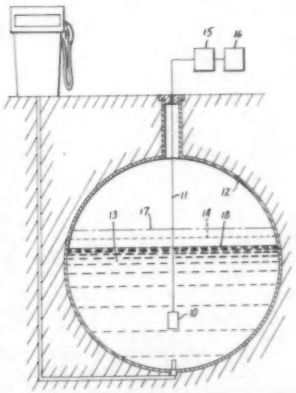
from said primary insulation space (140) during a period of time, said determining means (250) being further connected to said second supply means (220) and to said secondary insulation space exhausting means (240) for calculating any secondary flow difference between the total mass flow of said inert gas into and out from said secondary insulation space (120) during said period of time, said primary and secondary flow differences being indicative of a leak present in said secondary barrier (130).

4,404,844

LEAK DETECTING METHOD

Roy E. Hegler, Forest Lake, Minn., assignor to Duane L. Knopik, Stacy, Minn.

Filed Jan. 22, 1982, Ser. No. 341,854
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.2 **1 Claim**



1. Method of detecting leakage in a vessel containing liquid, comprising the steps of:

(a) placing into said vessel beneath the surface of said liquid a submersible diaphragm-type pressure transducer having an integral operational amplifier;

(b) energizing said operational amplifier to obtain an initial electrical output;

(c) recording said initial electrical output;

(d) adjusting the liquid volume of said vessel by a predetermined amount;

(e) recording the electrical output after the adjustment in volume;

(f) calculating a calibration factor by dividing the adjusted volume by the change in electrical output;

(g) recording the electrical output at the beginning of a predetermined period of time;

(h) recording the electrical output at the end of said predetermined period of time; and

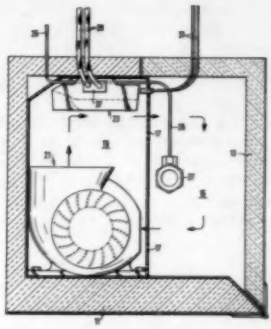
(i) calculating the volume of liquid lost by subtracting the electrical output at the end of said predetermined period of time from the electrical output at the beginning of said predetermined period of time and multiplying the result by said calibration factor.

4,404,845

THERMAL REGULATOR FOR LIQUID CHROMATOGRAPHS

Helge Schrenker, Karlsruhe, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Boeblingen, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,394
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026267
Int. Cl.³ G01N *31/00*; B01D *15/08*; F25B *29/00*
U.S. Cl. 73—61.1 C **2 Claims**



1. A thermal regulator for the mobile phase and the separation column in a liquid chromatograph having a sample injection device, said thermal regulator comprising:

a heat exchanger including a capillary tube through which the mobile phase passes, said heat exchanger being disposed between the sample injection device and the entrance of the separation column and containing a heating element and a cooling element for respectively heating and cooling ambient air surrounding the separation column;

said capillary tube, said heating element and said cooling element being sealed within a molded radiator body of heat conducting material disposed in contact with ambient air surrounding said separation column;

said capillary tube having an inner diameter of less than 0.15 mm and a volume of less than 2 μl within the heat exchanger;

whereby a variation of the flow rate of the mobile phase within a range of 0 to 5 ml/min causes a temperature deviation of less than ±2 degrees C.

4,404,846

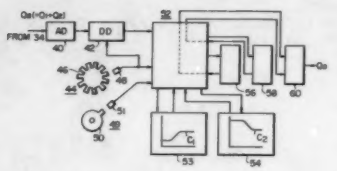
AIR FLOW RATE MEASURING DEVICE INCORPORATING HOT WIRE TYPE AIR FLOW METER

Teruo Yamauchi, Katsuta; Yoshishige Ohyama, Katsuta; Hiroshi Kuroiwa, Hitachi; Mamoru Fujieda, Nishiibaraki, and Tadashi Kirisawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP81/00018, § 371 Date Sep. 9, 1981, § 102(e) Date Sep. 9, 1981, PCT Pub. No. WO81/02202, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 28, 1981, Ser. No. 302,435
Claims priority, application Japan, Jan. 31, 1980, 55-11346
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—118 **4 Claims**

1. An air flow rate measuring device making use of a hot wire type air flow meter comprising: a hot wire type air flow meter including a hot wire type flow rate measuring sensor disposed in the intake air passage of an internal combustion engine and a control drive circuit connected to said sensor, said hot wire type air flow meter being adapted to produce a first signal corresponding to the flow rate of air in said intake air passage; a reversing flow signal generating means adapted to

generate a second signal representing the period of occurence of reversing or backward flow of air in said intake air passage; a first operation unit connected to said control drive circuit and said reversing flow signal generating means and adapted to generate, upon accumulation of the first signal representing



said flow rate of air, a third signal representing the amount of air in said period of occurence of reversing flow and a fourth signal representing the amount of air in the period other than said period of occurence of reversing flow; and a second operation unit adapted for subtracting said third signal from said fourth signal derived from said first operation unit.

4,404,847

FUEL SUPPLY CONDITIONING AND FLOW MEASUREMENT CIRCUIT

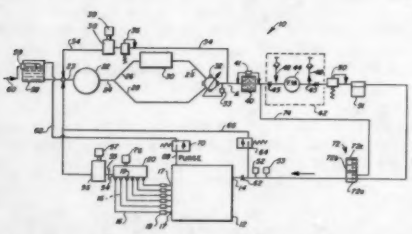
Larry A. Larson, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01057, § 371 Date Aug. 7, 1981, § 102(e) Date Aug. 7, 1981, PCT Pub. No. WO83/00555, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 7, 1981, Ser. No. 294,760

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **18 Claims**



1. In a fuel supply flow measuring circuit (10) to test a fuel injection apparatus (12), said circuit (10) having a fuel reservoir (58), a pump (22) having a suction side (23) communicating with said reservoir (58) and a discharge side (24) supplying fuel to the injection apparatus (12), means (44) for measuring the flow of fuel supplied to the injection apparatus (12) and means (50) for controlling the pressure of the supply fuel to the injection apparatus (12), the improvement comprising:

a recirculation line (34) bypassing said flow measuring means (44) and said injection apparatus (12) and connecting the pump discharge side (24) and the pump suction side (23), said recirculation line (34) adapted for recirculating a predetermined proportion of fuel flow from the pump discharge side (24) to the pump suction side (23); and

a deaeration means (38) for removing entrained air from the fuel, said deaeration means (38) positioned in said recirculation line (34).

4,404,848

METHOD FOR CORRECTING MEASUREMENT ERRORS IN TIRE UNIFORMITY INSPECTING MACHINES

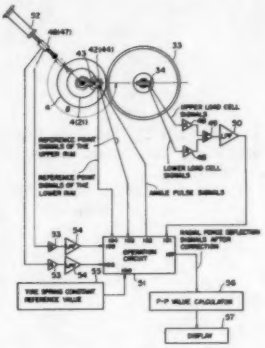
Atsuaki Iwama; Yoshimata Maikuma, both of Kobe; Masayoshi Okamoto, Kakogawa; Toshikazu Tanaka, Ashiya, and Yuji Oikawa, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 23, 1982, Ser. No. 351,513

Claims priority, application Japan, Feb. 26, 1981, 56-29015; Mar. 3, 1981, 5630605

Int. Cl.³ G01M *17/02*

U.S. Cl. 73—146 **7 Claims**



1. A method for correcting errors of measurement in a tire uniformity inspecting machine having a pair of upper and lower rims engageable with bead portions of a tire for gripping said tire securely for rotation at a predetermined position and a load wheel engageable with the circumference of said tire at one side thereof to check for variations in the radial force of said tire, said method comprising:

measuring radial runout of said rims and load wheel to obtain an erroneous deflection signal indicating the amount of radial runout of said rims and load wheel;

obtaining and storing a primary harmonic component of said erroneous deflection signal;

measuring variations in radial force of a tire rotated on said rims to obtain a radial variation signal for a period of one revolution of said tire;

multiplying said erroneous deflection signal by a spring constant of said tire to obtain an erroneous variation signal; and

subtracting said erroneous variation signal from said radial variation signal to eliminate influence of radial runout of said rims and load wheel from the measured value of said radial force of said tire.

4,404,849

METHOD AND SYSTEM FOR CORRECTING ERRORS OF MEASUREMENT IN TIRE UNIFORMITY INSPECTING MACHINES

Atsuaki Iwama; Yoshimata Maikuma, both of Kobe; Masayoshi Okamoto, Kakogawa; Toshikazu Tanaka, Ashiya, and Yuji Oikawa, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 23, 1982, Ser. No. 351,514

Claims priority, application Japan, Feb. 26, 1981, 56-29017

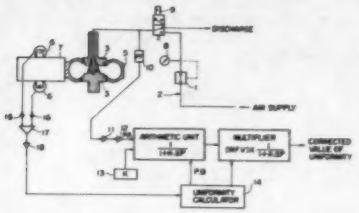
Int. Cl.³ G01M *17/02*

U.S. Cl. 73—146 **4 Claims**

1. A method for correcting errors of measurement due to variations in tire pressure in a tire uniformity inspecting operation, wherein a tire is inflated and rotated between a pair of

rims, a load wheel is pressed against the tire, and a radial force variation of the tire is measured, said method comprising:

detecting a deviation of actual air pressure of said tire from a predetermined measuring pressure level to determine a correction coefficient;



calculating a value of tire uniformity from the actually measured value of radial force variation of said tire according to the predetermined measuring pressure level; and

multiplying the calculated value of uniformity of said tire by said correction coefficient to compensate for any erroneous component due to a variation in the tire pressure.

4,404,850

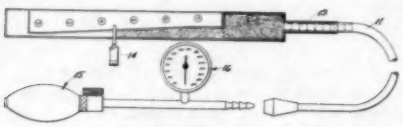
ANEURYSM CLIP TESTING INSTRUMENT

Horst R. Hickmann, 1455 Montegor, Cincinnati, Ohio 45230

Filed Jan. 11, 1982, Ser. No. 338,367

Int. Cl.³ G01L *5/00*

U.S. Cl. 73—161 **7 Claims**



1. An instrument for testing vascular and aneurysm clips by simulating the pressure of the vascular system and the diameter of the vessel at the implant site, said instrument comprising:

an elongated, thin test strip having a first compartment, a second compartment and a tapered channel connecting said first and second compartments;

means for filling said test strip with a fluid; and

gauge means for indicating the pressure within said test strip;

whereby when one of said clips is applied across said tapered channel at a location corresponding in size to a vessel or aneurysm neck, and said test strip is filled with said fluid until the fluid reaches the location of said clip, with the pressure of said fluid being continually increased until said clip fails, the amount of pressure is indicated on said gauge means.

4,404,851

BASE ASSEMBLY FOR WHEEL BALANCING MACHINE

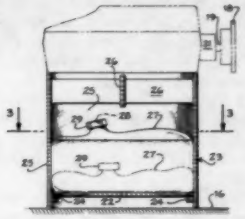
Donald B. Curchod, 23555 Mt. Eden Rd., Saratoga, Calif. 95070

Filed May 26, 1981, Ser. No. 266,792

Int. Cl.³ G01M *1/02, 1/16*

U.S. Cl. 73—460 **5 Claims**

1. In a balancing machine of a type having means for supporting a body for rotation and having means for detecting and measuring imbalance forces acting upon the body, a support base comprising upstanding rigid walls of relatively light weight material forming the sides thereof for supporting the first and second named means at an appropriate working height above a support surface, an opening extending through an end of the base, a bottom closure panel disposed within and adjacent the bottom end of said base, and readily removable means resting freely thereon and independently thereof for containing ballast material in fluid form for stabilizing said



support base and for damping movement imparted thereto by rotation of said body.

4,404,852

FROST SENSOR

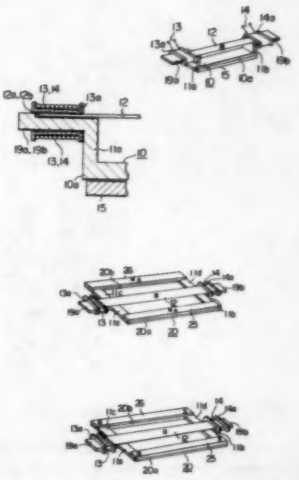
Norio Goto, Tokyo, Japan, assignor to Hitachi, Ltd.; Hitachi Metals, Ltd. and Research Development Cooperation of Japan, all of Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,816

Claims priority, application Japan, Jun. 25, 1980, 55-85095

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—599 **11 Claims**



1. A frost sensor for detecting the presence of frost comprising;

(a) an acoustic transmitting medium for detecting the frost made of a magnetic metal material having a magnetostrictive property and having a ribbon shape, said acoustic transmitting medium being adapted to be disposed in an environment which allows the frost to be detected to be deposited thereon,

(b) a support member made of a non-magnetic material, the opposite ends of said acoustic transmitting medium being fixedly mounted on said support member with a center portion between said opposite ends of said acoustic transmitting medium extending on said support member, said support member having a permanent magnet arranged in

parallel to said center portion and in spaced relation thereto by a predetermined distance,

(c) a first transducer having a coil wound and mounted on one of said opposite ends of said acoustic wave transmitting medium fixedly mounted on said support member, said first transducer generating an acoustic wave in said acoustic transmitting medium in response to the application of a current to said coil,

(d) a second transducer having a coil wound and mounted on the other end of said acoustic transmitting medium fixedly mounted on said support member, said second transducer transducing said acoustic wave to an electrical signal, and

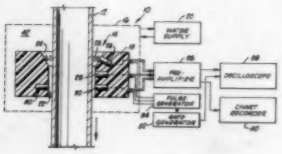
(e) said permanent magnet being fixedly mounted to extend in parallel to said center portion of said acoustic transmitting medium and in spaced relation thereto by the predetermined distance, said permanent magnet applying a biasing magnetic field to said acoustic transmitting medium.

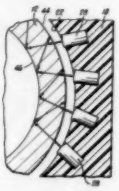
4,404,853

METHOD AND APPARATUS FOR ULTRASONIC TESTING OF TUBULAR GOODS

Waylon A. Livingston, 2534 Hollywood, Norman, Okla. 73069

Filed Mar. 12, 1981, Ser. No. 242,833
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—622 **30 Claims**





1. Apparatus for ultrasonic testing of tubular goods, comprising:

array block means defining a cylindrical central bore area;

plural ultrasonic energy transducers secured in said block means for transmitting and receiving ultrasonic energy toward said central bore area, said plural transducers including a first equi-spaced circumferential array of transducers for detecting transverse discontinuities and a second equi-spaced circumferential array of transducers for detecting longitudinal discontinuities;

means for disposing tubular goods in said central bore area for movement relative to said plural ultrasonic energy transducers;

fluid enclosure means including a central bore area defined by a slidable seal for maintaining a fluid environment between each of said plural ultrasonic energy transducers and said tubular goods; and

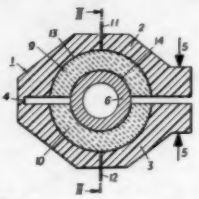
means for energizing said plural ultrasonic transducers and indicating received energy variations due to discontinuities in said tubular goods.

4,404,854

TRANSDUCER DEVICE FOR MEASURING MECHANICAL VALUES ON HOLLOW BODIES

Peter Krempl, Vienna; Rudolf Zeiringer, and Peter Claassen, both of Graz, all of Austria, assignors to Hans List, Graz, Austria

Filed Jun. 15, 1981, Ser. No. 273,685
Claims priority, application Austria, Jun. 16, 1980, 3178/80
Int. Cl.³ G01L *9/06*
U.S. Cl. 73—730 **9 Claims**



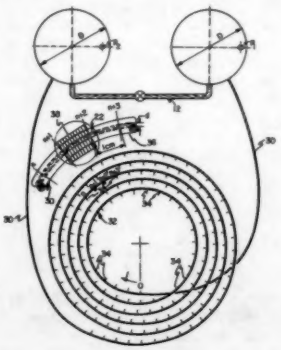
1. A transducer device for measuring mechanical values on hollow bodies, such as the internal pressure in pipes, by detecting deformations at the outer surface thereof, comprising a removable housing for removably enclosing the hollow body whose outer surface deformation is to be measured, said housing comprising an elastic endorsing element, and at least one elastic sensor member being elastically pressed against the outer surface of said hollow body by said elastic endorsing element said member being capable of stretching due to the deformation of said hollow body due to the frictional contact therewith, and wherein said endorsing element and said sensor element are of one-piece construction.

4,404,855

HIGH SENSITIVE MICROMANOMETER

Wolfgang Leidenfrost, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 15, 1981, Ser. No. 311,509
Int. Cl.³ G01L *7/18*
U.S. Cl. 73—747 **2 Claims**



1. A high sensitivity micromanometer comprising:

first and second vertically disposed monometer legs of large and equal diameter, each with pressure access ports and having a liquid contained therein;

a coiled capillary tube interconnected between said first and second momometer legs;

a tube having a large diameter interconnected between said first and second manometer legs;

valve means for equalizing the level of a liquid contained in

said manometer legs in the same horizontal plane by regulation of the flow of said liquid through said large diameter tube connected between said legs;

septum means connected to said coiled capillary tube for introduction of a gas bubble therein;

scale means for measuring the displacement of said gas bubble; and

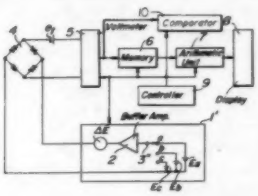
whereby pressure differentials between said pressure access ports are magnified on the order of at least 10^4.

4,404,856

STRAIN MEASURING DEVICE

Harukichi Honda, Tachikawa; Toshiya Kawada, Komae, and Yoshiyuki Tsujitsugu, Tama, all of Tokyo, Japan, assignors to Kyowa Electronic Instruments Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 28,686, Apr. 10, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,373
Claims priority, application Japan, Apr. 18, 1978, 53-46180
Int. Cl.³ G01B 7/18
U.S. Cl. 73—765 **2 Claims**



1. A strain measuring device using a Wheatstone bridge circuit comprising:

a bridge current supply source including therein a plurality of bridge excitation voltages of different magnitudes with a predetermined difference between each pair of these magnitudes, an excitation voltage changing switch for switching from one said excitation voltage to another, and a driver circuit for exciting said Wheatstone bridge by the bridge excitation voltage determined by said changing switch plus a spurious drift voltage inherent in the circuit,

a voltmeter for measuring output voltage derived from said Wheatstone bridge, said output voltage including an undesirable thermal electromotive force produced inside or outside of said Wheatstone bridge,

a memory for memorizing each said measured value,

an arithmetic unit for arithmetically processing each said memorized value, and

controlling circuit means for controlling said excitation voltage changing switch of the bridge current supply source, and for controlling sequence operation of said voltmeter, said memory, and said arithmetic unit in response to the switching operation of the excitation voltage changing switch, said circuit means for controlling said excitation voltage changing switch of the bridge current supply source including means to excite the Wheatstone bridge circuit by a pair of different excitation voltages in time division relationship,

said memory memorizing each measured value measured by said voltmeter,

said circuit means for controlling sequence operation then causing said arithmetic unit to subtract one of each pair of the respective measured values memorized in the memory from the other,

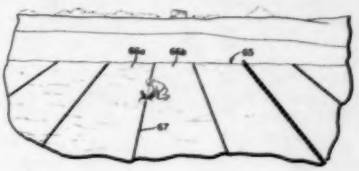
whereby the spurious components affecting the measurement of strain are removed, including potential error due to said thermal electromotive force produced inside or outside said Wheatstone bridge and sensitivity error due to said drift voltage occurring in the driver circuit of the bridge current source.

4,404,857

SEAM TESTER

Leslie C. Hardison, Barrington, and Kenneth A. Sandstrom, Prospect Heights, both of Ill., assignors to National Seal Company, Palatine, Ill.

Filed Sep. 18, 1981, Ser. No. 303,215
Int. Cl.³ G01N 3/08
U.S. Cl. 73—827 **10 Claims**



1. A portable seam tester for use on a large section of flexible sheet material formed from smaller panels of said material secured together along elongated seams, said tester comprising:

an elongated piston and cylinder mechanism having a retracted position and an extended position;

a pair of clamping means carried on said piston and cylinder mechanism;

said tester being adapted to be positioned transversely across a seam of said large section of flexible sheet material inwardly from the periphery of said section with said clamping means disposed at opposite sides of the seam, and said clamping means being adapted to receive and retain folded double-thickness portions of said material at opposite sides of the seam when said piston and cylinder mechanism is in said retracted position;

each of said clamping means comprising a support having a curved outer surface portion adapted to have said material wrapped therearound, and a manually operable clamping member mounted on said support and being movable from a released position to a clamping position in which said clamping member presses said folded double-thickness portion of said material against the outer surface of said support for frictionally retaining said material; and

means for controllably supplying pressurized fluid to said piston and cylinder mechanism to effect movement thereof toward said extended position, whereby to place said material in tension and impose a predetermined stress on the seam.

4,404,858

VELOCITY AND MASS AIR FLOW SENSOR

Chester J. Blechinger, Bloomfield Hill, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1981, Ser. No. 315,096
Int. Cl.³ G01F 1/34, 1/32, 1/76
U.S. Cl. 73—861.02 **6 Claims**

3. A device for measuring mass fluid flow comprising:

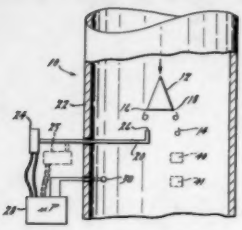
vortex generating means positioned in a fluid stream so that vortices are formed in the wake of said generating means;

pressure sensor means positioned in the wake of said generating means for sensing a pressure variation caused by the passage of the vortices and for sensing average background pressure;

a temperature sensor means positioned in the fluid stream for providing a signal indicative of the temperature of the fluid stream; and

a processing means coupled to said pressure sensor means

and said temperature sensor means for determining the mass fluid flow as a function of pressure changes and



average pressure sensed by said pressure sensor means and temperature sensed by said temperature sensor means.

4,404,859

FLOWMETER

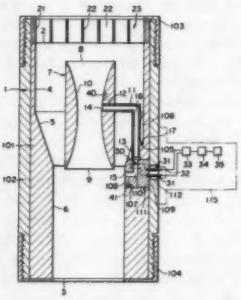
Katsuyuki Ohsawa, Nagoya; Katsuhiko Sugiyama, Aichi, and Yoshinori Idota, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jan. 20, 1982, Ser. No. 341,112

Claims priority, application Japan, Jan. 26, 1981, 56-9888

Int. Cl.³ G01F 1/20

U.S. Cl. 73—861.18 **9 Claims**



1. A flowmeter comprising:

a first tube having an inlet and an outlet at axial ends thereof and a first flow passage having a cross-sectional area extending perpendicularly to a central axis of said first tube and smaller at said outlet than at said inlet, said first tube having a first port defined in a sidewall thereof and opening into said first flow passage;

a second venturi-shaped tube disposed substantially concentrically within said first flow passage of said first tube and having an inlet and an outlet at axial ends thereof and a second flow passage having a cross-sectional area which is minimum substantially midway of said second tube in an axial direction thereof, said second tube having a second port defined in a sidewall thereof and opening into said second flow passage at the minimum cross-sectional area thereof;

a third flow passage providing fluid communication between said first and second ports; and

a sensor disposed in one of said third flow passage, said sidewall of the first tube and said sidewall of the second tube for detecting periodic variations in the condition of a fluid flowing through said first, second, or third flow passage, thereby detecting effectively the rate of flow of the fluid through said first and second tubes.

4,404,860

FLOW RATE SENSOR

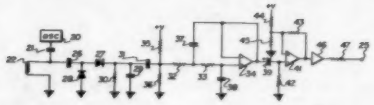
Hugh C. Wood, and Simon W. J. H. Okkerse, both of Saskatoon, Canada, assignors to SED Systems Inc., Saskatoon, Canada

Filed Jan. 26, 1981, Ser. No. 228,525

Claims priority, application Canada, Feb. 1, 1980, 344891

Int. Cl.³ G01F 1/75

U.S. Cl. 73—861.78 **12 Claims**



1. Apparatus for detecting rates of motion comprising:

(a) an inductor and a capacitor connected in a series circuit,

(b) an oscillator connected in series with said circuit adapted to apply a signal to said circuit at a frequency at which the inductor and capacitor are in series resonance,

(c) means for detecting the repetitive passage of a metallic element through the field of said inductor including:

(i) means connected in parallel with said inductor for detecting the envelope of said signal, and

(ii) means for converting pulsations in said envelope to an output signal designative of said passage repetition rate of said metallic element,

in which the frequency of said signal is a multiple of the highest expected repetition rate of passage of said element through said field.

4,404,861

LIQUID FLOWMETER

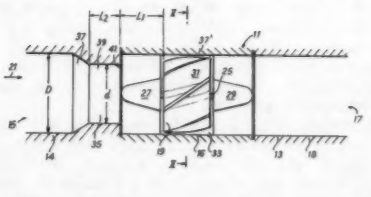
Colin Wass, Castleford, England, assignor to Brown Boveri Kent Limited, Bedfordshire, England

Filed Jul. 22, 1981, Ser. No. 285,640

Claims priority, application United Kingdom, Aug. 4, 1980, 8025316

Int. Cl.³ G01F 1/12

U.S. Cl. 73—861.83 **6 Claims**



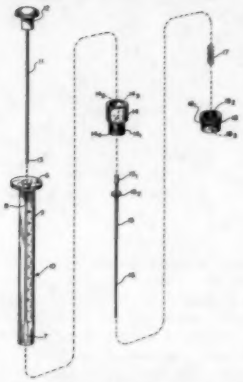
1. A liquid flowmeter comprising a flow passageway having coaxially disposed inlet and outlet ends, a freely rotatable vaned flow measuring rotor within the passageway and disposed with its axis of rotation extending along the direction of flow and a constriction in the passageway upstream of the rotor, the remainder of the passageway being of uniform cross-section and the constriction comprising a main portion of uniform cross-section less than that of the passageway which at the downstream end thereof opens directly into the passageway in the vicinity of the rotor and a portion at the upstream end which is of tapering form and connects the main portion of the constriction with the passageway, whereby the velocity profile across the passageway at the rotor arising at laminar flow rates is substantially unaffected by the presence of the constriction and the velocity profile across the passageway at the rotor arising at turbulent flow rates is altered by the presence of the constriction.

4,404,862

MICRODISPENSING SPRINGS WITH A NEEDLE IN A TUBULAR EXTENSION

Rano J. Harris, Sr., Baton Rouge, La., assignor to Dynatech Precision Sampling Corporation, Baton Rouge, La.

Filed Nov. 2, 1981, Ser. No. 317,070
Int. Cl.³ G01F *11/06*
U.S. Cl. 73—864.16 **5 Claims**



1. In apparatus useful for dispensing small, or infinitesmal accurately measured quantities of a fluid, which embodies a tubular barrel having a bore therethrough, a plunger reciprocably mounted within the bore from a rearward end of said barrel, a tubular extension member mounted and sealed within a forward end of said barrel, and a tubular needle mounted in said tubular extension member such that a fluid can be drawn into the tubular needle from a dispensing end thereof by withdrawal of the plunger within the barrel, and dispensed from the dispensing end of the needle by forward movement of said plunger within the barrel, the improvement which, in combination, comprises

a conical entry located within the forward end of the barrel coaxially aligned and contiguous with the bore of said barrel,

said tubular extension member provided with a bore therethrough having an internal diameter substantially equal to an external diameter of the tubular needle, a rearward end of said tubular needle mounted in said tubular extension member to provide coaxially aligned bores through which fluid can flow from the dispensing end of said needle through the bore of said tubular extension member,

a tubular seal mounted on a rearward end of said tubular extension member, the rearward end of said tubular extension member being extendable into the barrel,

a stop externally located on said tubular extension member intermediate a forward terminal end of the tubular extension member and the tubular seal,

a hub mounted on the forward end of said barrel and having an opening therein through which the sealed rearward end of said tubular extension member can pass for sealing engagement with the conical entry at the forward end of said barrel,

a coil spring concentrically mounted about the tubular extension member, a rearward end of the spring seated against the stop of said tubular extension member,

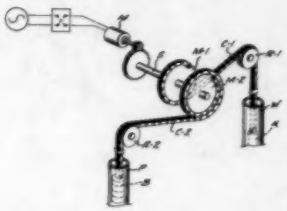
a cap having an opening through which the needle and forward end of said tubular extension member extends, an inside forward wall of said cap providing a seating surface against which a forward end of said coil spring rests and is retained, said cap being adjustably engagable with said hub so that a preselected compressive force can be exerted upon said spring for retention of said needle and tubular extension member in place on the forward end of the barrel of the syringe without the application of excessive force.

4,404,863

COUNTERBALANCED PUMPS AND METHOD OF USING SAME

Robert G. James, Whittier, Calif., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 29, 1980, Ser. No. 220,435
Int. Cl.³ F16H *29/02*
U.S. Cl. 74—89.2 **10 Claims**



1. In a counterbalanced pumping system having a set of sheave chains wound in opposing directions over mandrels, said sheave chains supporting a pump rod string and a counterbalance, and a motor operatively engaged to maintain said mandrels in oscillation, the improvement comprising:

said sheave chains having ends pivotally secured to said mandrels and having lengths selected for full unwinding of one upon the reversal of the other; and

turning means mounted proximate said mandrels for supporting said sheave chains and for aligning the ends thereof to a vertical alignment, said turning means being aligned relative said mandrels to produce a torque reversal thereabout upon the full unwinding of each sheave chain.

9. A method for reducing the reversal periods of a counterbalanced pump having a set of sheave chains wound in opposing directions over mandrels, said sheave chains supporting a pump rod string and a counterbalance, and a motor operatively engaged to maintain said mandrels in oscillation, comprising the steps of:

driving said motor to unwind one of said sheave chains; and

coasting said mandrels to wind said one sheave chain in the same direction as the other.

4,404,864

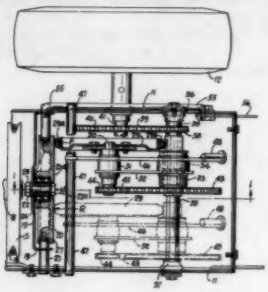
VARIABLE SPEED DRIVING MECHANISM

Bhupendra A. Parikh, Parma, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Oct. 23, 1980, Ser. No. 199,817
Int. Cl.³ F16H *15/08*
U.S. Cl. 74—197 **3 Claims**

1. In a variable speed power transmission mechanism for delivering power from an engine to a working part, the mechanism having a driving wheel rotatable by the engine, a friction wheel engageable with the driving wheel to be driven in accordance with the then current location of the engagement of the friction wheel with the driving wheel, the friction wheel being carried on a shaft rotatable with the friction wheel, the working part being operatively connected to a driven shaft, to be rotated by the same, said driven shaft having a non-cylindrical outer surface, the improvement of a first bearing assembly rotatably carrying said friction wheel carrying shaft, a second bearing assembly having an inner part non-rotatively engaging said driven shaft and longitudinally slidable along said driven shaft and having an outer part concentrically mounted about said inner part to permit the inner part and said driven shaft to rotate within the said outer part, supporting means connected to both said first bearing assembly and the outer part of said

second bearing assembly to support the same and to maintain their respective axes parallel to each other, driving connection means inter-connecting said friction wheel carrying shaft and said driven shaft to provide for rotation of the driven shaft by the friction wheel, shifting means connected to said supporting means for shifting said supporting means along a path parallel



to the axis of said first bearing assembly and said second bearing assembly, the shifting of said supporting means changing the location of the friction wheel relative to the axis of said driving wheel while maintaining the driving connection between said friction wheel carrying shaft and said driven shaft at varying shiftable positions of the first bearing assembly and second bearing assembly.

4,404,865

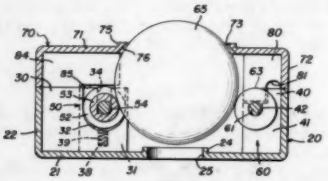
TRACKBALL DEVICE

Snyg N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Feb. 10, 1982, Ser. No. 347,469

Int. Cl.³ F16H *13/00*; G05G *9/00, 13/00*

U.S. Cl. 74—471 XY **12 Claims**



1. In a trackball position control device including a housing having a circular opening therein, a plurality of rotatable supports in the housing, at least first and second ones of which are respectively rotatable about orthogonally related axes, and a ball seated on and supported by the supports with a portion of the ball projecting through the opening for manual rotation by a user, wherein each of the first and second supports rotates in response to a corresponding component of rotational movement of the ball for generating control signals, the improvement comprising: mounting means accommodating movement of the first and second supports in directions toward and away from the plane of the opening and preventing movement of the first and second supports in directions parallel to the plane of the opening, and bias means carried by the housing and resiliently urging the first and second supports toward the plane of the opening.

4,404,866

REGULATOR HANDLE ASSEMBLY FOR THE OPERATION OF CAR WINDOW GLASS

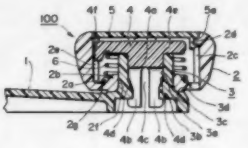
Shyouichi Koike, Tokyo; Toshiharu Iidaka, Funabashi, and Akio Ohyama, Kawasaki, all of Japan, assignors to Nissan Motor Co. Ltd., Yokohama and Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jan. 23, 1981, Ser. No. 227,775

Claims priority, application Japan, Feb. 26, 1980, 55-22186

Int. Cl.³ B25G *3/00*; G05G *1/00*

U.S. Cl. 74—546 **6 Claims**



1. Regulator handle assembly for operating a window glass of a vehicle, comprising:

a handle lever associated with said window glass,

a cylindrical sleeve formed at the free end of said handle lever, said sleeve being substantially perpendicular to said handle lever and having at its lower portion a projection extending inwardly from an inner surface thereof,

a plug member rotatably received in said cylinder, said plug member having an extended leg which hooks on said projection and having a projection extending outwardly over said sleeve,

a hollow knob being rotatable relative to said sleeve, said hollow knob having at its lower portion a projection extending inwardly and at its inner surface an axially extending recess which axially slidably receives said projection of said plug member, and

a spring disposed between said projections of said plug member and said hollow knob, said plug member, said hollow knob, and said spring being rotatable as a unit with respect to said sleeve,

whereby said hollow knob is normally in a retracted position and can be pulled out to be manipulated.

4,404,867

GEAR UNIT

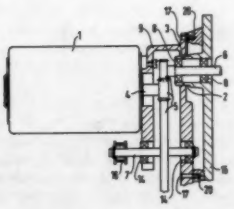
Gerhard Müeller, Taufkirchen, and Ernst Puritscher, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,885

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116793

Int. Cl.³ F16H *37/06, 35/06*

U.S. Cl. 74—665 GA **6 Claims**



1. A gear transmission device for connecting to a rotary motor having a drive shaft comprising a housing for receiving therein said drive shaft and first and second driven shafts, said

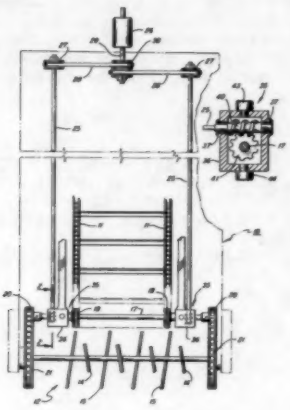
first driven shaft being mounted for rotation on bearing means carried by a stationary support plate, said second driven shaft being mounted for rotation on bearing means carried by said housing, a centering means for maintaining said first driven shaft aligned with said housing, a releasable fastening means connecting said housing for rotation relative to said support plate, and gear wheels drivingly interconnecting said drive shaft with said first and second driven shafts respectively.

4,404,868

WAGON TRANSMISSION

William H. Kleine, R.D. #1, McGraw, N.Y. 13101

Filed Jun. 4, 1982, Ser. No. 385,074
Int. Cl.³ F16H *37/06*; A01C *19/00, 17/00*
U.S. Cl. 74—665 GE 3 Claims



1. In an agricultural wagon of the type having beaters, a spreader apron and a power train for driving the beaters and the spreader apron, said wagon further including

a prime mover having a gear box,

a pair of power take-off shafts coupled to the gear box so that both shafts rotate at the same speed,

a common main shaft connected to the pair of take-off shafts by a pair of transmissions that are spaced apart along the main shaft whereby the main shaft passes through both transmissions,

each of said transmissions including a housing for enclosing a gearset within an oil bath,

a pair of beater sprockets affixed to the main shaft with a beater sprocket being located on either side of the transmission pair, and

a pair of apron sprockets also affixed to the main shaft between the transmission pair.

4,404,869

POWER TRANSMISSION UNIT FOR MOTOR VEHICLES

Akio Numazawa, Nagoya, and Hajime Arai, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 954,121, Oct. 24, 1978, abandoned.
This application Jan. 19, 1981, Ser. No. 226,532
Claims priority, application Japan, Apr. 20, 1978, 53/47336
Int. Cl.³ F16H *37/00*
U.S. Cl. 74—740 3 Claims

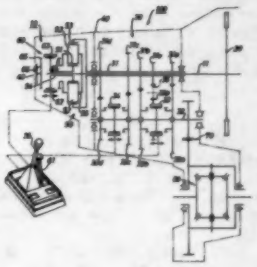
1. A power transmission unit for a motor vehicle comprising:

an elongated input shaft drivingly connected to an output shaft of an engine through a disengageable coupling;

a primary transmission having an elongated main sleeve shaft in surrounding relationship to said input shaft, a countershaft arranged in parallel with said main sleeve shaft, change-speed gearing means mounted in association with said main sleeve shaft and said countershaft and selectively operable to provide a plurality of forward speed ratios and at least one reverse speed ratio between said main sleeve shaft and said countershaft, and shift means;

a final drive gearing drivingly connected to said countershaft to drive a differential gear unit;

an auxiliary transmission having a sun gear rotatably mounted on said input shaft, a ring gear integral with said



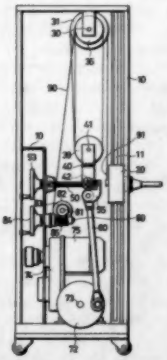
main sleeve shaft, a planet carrier integral with said input shaft, a plurality of planet gears rotatably mounted on said planet carrier, said planet gears being in mesh with said sun gear and said ring gears, a selector gear unit comprising a first spline drivingly connected to said sun gear, a reaction member stationary with respect to said auxiliary transmission, a slide solidly engaged with said spline and said planet carrier and also with said spline and said reaction member, said primary transmission being arranged between said disengageable coupling and said auxiliary transmission.

4,404,870

RECIPROCATOR FOR PAINT GUN

Ayakazu Atumaru, 3-21 kajihara 2-Chome, Takatsuki-Shi, Osaka-Fu, Japan

Filed Jun. 18, 1981, Ser. No. 274,786
Int. Cl.³ F16H *35/08, 19/06*
U.S. Cl. 74—829 3 Claims



1. A reciprocator for paint gun comprising a slider for mounting a paint gun, said slider slidably engaged with an upright rail fixed on a frame so that the slider may be capable of ascending and descending along the rail, fixed pulleys rotatably supported at an upper portion of the frame, movable

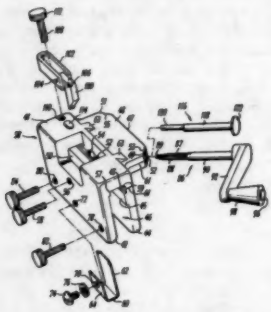
pulleys rotatably supported on a common shaft below said fixed pulleys, the number of said movable pulleys being one less than the number of said fixed pulleys, a bracket for mounting said common shaft and supporting a movable rod, said movable rod having a threaded hole, a threaded rod threadably engaged with said threaded hole, one end of said threaded rod connected via a universal joint to a handle rotatably supported on the frame, and the other end of said threaded rod connected to one end of a connecting piece, a connecting rod having one end pivotably connected to the other end of said connecting piece and the other end pivotably connected to a crank pin, a winch device having a drum rotatably supported at a middle portion of the frame, said drum adapted to be rotated by means of a handle, and a wire led from said slider to said drum through said fixed and movable pulleys, said wire having its ends fixed on said slider and said drum.

4,404,871

PORTABLE CHAIN SAW SHARPENING KIT WITH CUTTING LINK ALIGNMENT MEANS AND METHOD FOR USING SAME

Thomas A. Fritz, 8104 Larch La., Evansville, Ind. 47710, and James W. Shrode, 10435 Upper Mt. Vernon Rd., Evansville, Ind. 47712

Filed Oct. 2, 1981, Ser. No. 308,104
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—25 A **16 Claims**



1. A portable chain saw sharpening kit comprising:

(a) a unitary sharpener body in the form of a channel member adapted to be placed over the bar of a chain saw, said channel member comprising:

(1) an inverted U-shaped portion including an upper web and first and second side walls extending downwardly from said upper web, said side walls being parallel and spaced apart from each other to define a channel therebetween for receiving the bar of a chain saw with the saw chain thereon facing the underside of said upper web, adjoining portions of said upper web and said first side wall being cut away to define an open area near the center of said channel for receiving a cutting link of the saw chain;

(2) a horizontal extension projecting outwardly from said second side wall on the side opposite the channel, said extension being provided with first and second horizontal guide bores converging toward each other in the direction of the channel at equal angles with respect to a line perpendicular to the channel axis, said guide bores extending from opposite corners of said extension and opening through said second side wall into the open cutting link receiving area of the channel;

(b) first clamping means supported by said first side wall below the open cutting link receiving area for clamping a cutting link against said second side wall in a position adjacent to the open ends of said first and second guide bores;

(c) second and third clamping means supported by said first side wall for clamping the sharpener body to the bar of a chain saw, said second and third clamping means being provided at points near the lower corners of said first side wall;

(d) a rotary burr receivable in a selected one of said first and second guide bores, said rotary burr having an abradant end portion for sharpening a cutting link positioned in the open cutting link receiving area of the sharpener body; and

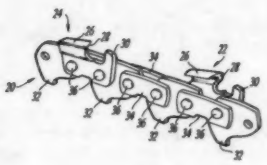
(e) an alignment pin receivable in a selected one of said first and second guide bores for longitudinally aligning a cutting link in the channel prior to sharpening, said alignment pin comprising a shank portion and a reduced end portion for abutting against the edge of the cutting link to be sharpened, said reduced end portion being dimensioned to allow for the removal of a predetermined amount of material from the edge of the cutting link when the rotary burr is subsequently inserted into the selected guide bore for sharpening.

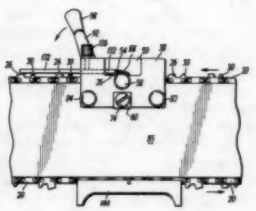
4,404,872

PORTABLE CHAIN SAW SHARPENING KIT WITH DEPTH GAUGE FILING ATTACHMENT AND METHOD OF USING SAME

Thomas A. Fritz, 8104 Larch La., Vanderburg County, Evansville, Ind. 47710

Filed Oct. 2, 1981, Ser. No. 308,105
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—25 A **14 Claims**





1. A portable chain saw sharpening kit comprising:

(a) a unitary sharpener body in the form of a channel member adapted to be placed over the bar of a chain saw, said channel member comprising:

(1) an inverted U-shaped portion including an upper web and first and second side walls extending downwardly from said upper web, said side walls being parallel and spaced apart from each other to define a channel therebetween for receiving the bar of a chain saw with the saw chain thereon facing the underside of said upper web, adjoining portions of said upper web and said first side wall being cut away to define an open area near the center of said channel for receiving a cutting link of the saw chain;

(2) a horizontal extension projecting outwardly from said

second side wall on the side opposite the channel, said extension being provided with first and second horizontal guide bores converging toward each other in the direction of the channel at equal angles with respect to a line perpendicular to the channel axis, said guide bores extending from opposite corners of said extension and opening through said second side wall into the open cutting link receiving area of the channel;

(b) first clamping means supported by said first side wall below the open cutting link receiving area for clamping a cutting link against said second side wall in a position adjacent to the open ends of said first and second guide bores;

(c) second and third clamping means supported by said first side wall for clamping the sharpener body to the bar of a chain saw, said second and third clamping means being provided at points near the lower corners of said first side wall below said first-mentioned clamping means;

(d) a rotary burr receivable in a selected one of said first and second guide bores, said rotary burr having an abradant end portion for sharpening a cutting link positioned in the open cutting link receiving area of the sharpener body; and

(e) a depth gauge attachment for allowing said rotary burr to be used for filing the depth gauge of a cutting link, said depth gauge attachment comprising:

(1) an elongated gauge bar shaped and dimensioned to be received in the channel of said sharpener body along the underside of the upper web of said inverted U-shaped portion, said gauge bar having a flat surface on the underside thereof to provide a guide surface for the upper portions of the cutting links on the saw chain, the thickness of said gauge bar being selected to cause the saw chain to assume a sufficiently lower position within the channel of the sharpener body to bring the top of the depth gauge portion of a cutting link into contact with the abradant end portion of the rotary burr when the rotary burr is inserted into one of said first and second guide bores; and

(2) means for removably affixing said gauge bar within the channel of the sharpener body such that the gauge bar occupies only a portion of the length of said channel, said portion not including the area immediately adjacent to the opening formed by said one of said first and second guide bores in the second side wall of the inverted U-shaped portion of the sharpener body, whereby said rotary burr can be inserted into said one of said first and second guide bores to file the depth gauge portion of a cutting link as said cutting link passes through the open cutting link receiving area of the sharpener body.

4,404,873

BLADE SHARPENER

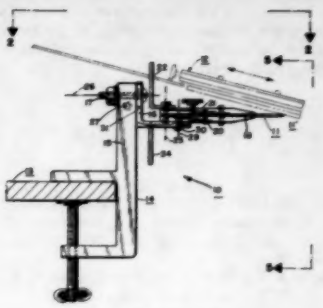
Madeline L. Radish, Westerville, Ohio, assignor to Howard Ray Longbrake, Grafton, Ohio

Filed Oct. 13, 1981, Ser. No. 310,507

Int. Cl.³ B24B *3/54*; B25B *1/22*

U.S. Cl. 76—82 **8 Claims**

1. In the combination of a support clamp, a vise adapted to pinch a blade having a cutting edge to be sharpened, an elongated sharpener engageable with said cutting edge for longitudinal reciprocal movement thereacross, and a guide pivoted on the vise on a guide axis and holding the sharpener in its path of reciprocal movement, the provision of, a post extending outwardly from said clamp in a direction parallel to a guide plane containing the guide axis, bracket means pivotally supporting said vise on said post on a support pivot axis generally transverse to the direction of the post, and positioning said vise and said guide and said sharpener with the sharpener extending



generally across the post and next adjacent to and spaced from said post.

4,404,874

SCREWDRIVER WITH REPLACEABLE BLADE

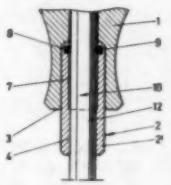
Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Firma Hermann Werner GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,781

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016932

Int. Cl.³ B25B *15/02*

U.S. Cl. 81—438 **13 Claims**



1. In a screwdriver with a replaceable polygonal blade and a handle, the blade being insertable in non-rotatable complementary manner from a front end of the handle into a cross-sectionally non-round opening of a socket, the socket with an interior portion of its length being seated non-rotatably in the handle, the opening defined by an inside wall of the socket being cylindrical at a portion thereof and the socket over the remainder of the length inside on the inside wall and outside is polygonal defining corners, the socket with said polygonal remainder of its length projecting beyond the front surface of the handle, and a spring element frictionally locking the blade being coordinated to the socket, the improvement wherein

said socket is polygonal on said outside along its entire length,

said cylindrical portion of the opening on the inside wall of the socket is formed so as to include an annular groove formed therein and spaced substantially apart from a transition of said opening defined by said inside wall from cylindrical to polygonal,

the spring element is formed as a closed annular ring and is partially encased in said annular groove on the inside wall of the cylindrical portion, extends radially inwardly beyond the radius of said cylindrical portion into said opening before said blade is inserted into said opening and forms an integral unit with said socket insertable into the handle, and

the cylindrical diameter of said cylindrical portion of the

inside wall approximately equals the width across two opposite of said corners of the opening on the inside wall of said polygonal remainder of the length of said socket, said width across said two opposite corners of said inside wall at said polygonal remainder of the length of said socket is defined by said two corners which are 180° opposite each other.

4,404,875

INSTALLER DRIVE UNIT FOR CHEMICAL ANCHOR

Kunissey P. Sadanandan, Reading, Pa., and Raymond S. Guntulis, Manchester, Conn., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 170,285, Jul. 18, 1980. This application Jul. 19, 1982, Ser. No. 399,402

Int. Cl.³ B25B *13/50*

U.S. Cl. 81—53.2 **3 Claims**

1. A drive unit for a threaded stud of predetermined diameter and thread pitch that is to be rotatably driven through the action of a rotary drill into a frangible ampule placed within masonry, concrete, rock or the like, said drive unit comprising:

a nut having a uniform thread diameter and a uniform thread pitch for threadably engaging the threads of said stud, said nut adapted to receive a first wrench;

a shank of unitary construction having a central portion with a generally polygonal cross-section and adapted to receive a second wrench;

said shank further having a first unitary cylindrical extension, disposed at one end of said central portion, for insertion into the chuck of a rotary drill; and

said shank still further having a second unitary extension with a threaded portion disposed at the other end of said central portion, the diameter and thread pitch of said threaded portion being substantially the same as said predetermined diameter and thread pitch of said stud whereby said nut having the same predetermined thread pitch and diameter is threaded onto both said stud and said threaded portion on the secondary extension of said shank so as to lock the two together prior to the stud being driven into a medium by rotation of the rotary drill and whereby said stud is ultimately detached from said shank by engaging the central portion with the second wrench and the nut with the first wrench and twisting the wrenches in opposite directions so as to disconnect the nut from the threaded portion of said second unitary extension without disturbing the inserted condition of said stud within the frangible ampule.

4,404,876

POWER TONGS

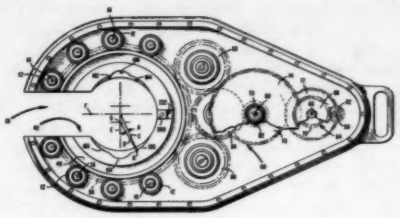
Emery L. Eckel, Odessa, Tex., assignor to Eckel Manufacturing Co., Inc., Odessa, Tex.

Continuation of Ser. No. 906,200, May 15, 1978, abandoned, which is a continuation of Ser. No. 698,324, Jun. 22, 1976, Pat. No. 4,089,240, which is a continuation-in-part of Ser. No. 671,959, Mar. 30, 1976, Pat. No. 4,084,453. This application Mar. 28, 1980, Ser. No. 135,176

The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.18 **6 Claims**



1. A power tong assembly for engaging and rotating a pipe member and the like about its longitudinal axis, comprising

a partial ring member rotatable about a center line and having an open throat portion for receiving said pipe member,

said partial ring member further having a plurality of arcuate cam surfaces spaced interiorly about and oppositely with respect to said center line of said ring member and each having a radius of curvature extending to a cam radius point spaced from said center line of said ring member,

a plurality of gripping members corresponding to the outside diameter of said pipe member and arranged within said ring member for movement relative to said center line of said ring member,

a plurality of cam followers each arranged between said ring member and one of said gripping members for engaging said cam surfaces and urging corresponding ones of said gripping members substantially diametrically and oppositely toward said pipe member to align said center line of said ring member with said longitudinal axis of said pipe member in response to rotation of said ring member,

said cam followers each further abutting one of said cam surfaces at a contact point defining the apex of a cam angle of not more that 5½ degrees when said gripping members engage said pipe member, said cam angle formed by a straight line commencing at said contact point and passing through said cam radius point and a second line commencing at said contact point and passing through said center line of said ring member, and

driving means for rotating said partial ring about said center line of said ring member and for driving said gripping members substantially equally and oppositely against said pipe member as a function of the magnitude of said cam angles.

4,404,877

POWER-DRIVEN SCREWDRIVER

Megumi Mizuno; Shigeru Ishikawa, and Eiki Kubo, all of Tokyo, Japan, assignors to Sanyo Industries, Ltd. and Muro Kinzoku Kogyo Co., Ltd., both of Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 309,975

Int. Cl.³ B25B *23/04*

U.S. Cl. 81—57.37 **7 Claims**

1. A power-driven screwdriver for attachment to a motor-driven tool for being driven thereby, comprising:

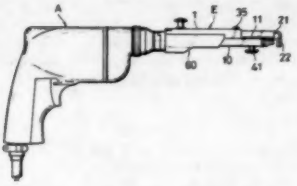
(a) an outer guide frame adaped to be mounted on the motor-driven tool;

(b) a slide block slidable into and out of said outer guide frame and having a bore;

(c) a screwdriver bit extending through said bore and adapted for attachment to the motor-driven tool, said outer guide plate having a first cam slot substantially parallel to said screwdriver bit and including an oblique portion;

(d) a slide plate slidably mounted on said slide block and having a protective plate, said slide plate having a second cam slot substantially normal to said screwdriver bit;

(e) a spring disposed around said screwdriver bit and acting between said outer guide frame and said slide block to normally urge the latter in a direction to slide out of said outer guide frame to a position in which a distal end of



said screwdrier is disposed in said slide block, said slide block and slide plate being movable into said outer guide frame against the bias of said spring when the motor-driven tool is pushed toward a workpiece with said protective plate held against the workpiece, before said screwdriver bit drives a screw home into the workpiece; and

(f) a screw indexing lever swingably mounted on said slide block and having a pin received in said first and second cam slots, said screw indexing lever being angularly movable to supply a next screw to a position in front of said screwdriver bit in response to movement of said pin in and along said oblique portion of aid first cam slot and said second cam slot.

4,404,878

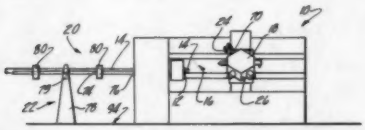
BAR STOCK FEED APPARATUS

Vernon F. Blanchard, 35406 Brookview, and Bradley V. Blanchard, 14417 Park, both of Livonia, Mich. 48152

Filed Mar. 26, 1981, Ser. No. 247,576

Int. Cl.³ B23B *15/00*

U.S. Cl. 82—2.5 **19 Claims**



1. In a machine for operating on elongate cylindrical bar stock, the improvement comprising:

a gripping device having a pair of adjustable, opposing cutting elements spaced apart a distance less than the outer diameter of the bar stock;

means for moving the gripping device transversely to the longitudinal axis of the bar stock to engage the bar stock from its side, with the cutting elements forming notches therein; and

means for moving the gripping device parallel to the longitudinal axis of the bar stock to pull the bar stock into a given area for performing work on the bar stock.

4,404,879

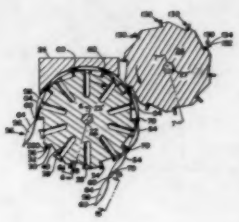
ACCURATELY PLACED STRESS CONCENTRATING APERTURE IN FLEXIBLE PACKAGES

Arthur E. Frohwerk, Harrison, Ohio, and David E. Eating, Americas, Ga., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 147,018, May 6, 1980, Pat. No. 4,332,327. This application Mar. 11, 1982, Ser. No. 357,021

Int. Cl.³ B26D *1/62, 9/00*

U.S. Cl. 83—22 **19 Claims**



1. A process for forming an easy open stress concentrating aperture in the seal area of a filled and sealed flexible pouch as said pouch is transversely severed from a continuous web of said pouches interconnected to one another along their sealed lateral edges, said stress concentrating aperture being located a predetermined distance from the severed edge of said pouch, said process comprising the steps of:

(a) advancing said web of interconnected pouches to a transverse web cutting means having web aperturing means secured a predetermined distance therefrom;

(b) fixing the position of said sealed lateral edge relative to said cutting and said aperturing means;

(c) subjecting said sealed lateral edge of said pouch to tension as said pouch is being transversely severed from said web along said lateral edge by said cutting means;

(d) contacting said sealed lateral edge and said aperturing means with one another while said sealed lateral edge is in tension and in an unsupported condition to concentrate the stress applied by said tension at said point of contact and thereby rupture said sealed lateral edge a predetermined distance from the severed edge of said pouch; and

(e) removing said pouch from said cutting and said aperturing means after said sealed lateral edge of said pouch has been transversely severed and apertured.

4,404,880

METHOD FOR WEB CUTTING IN ROLLED SHEET MATERIAL DISPENSERS

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation of Ser. No. 46,182, Jun. 6, 1979, abandoned, Division of Ser. No. 842,533, Oct. 14, 1977, Pat. No. 4,188,844. This application May 26, 1981, Ser. No. 266,652

Int. Cl.³ B26D *1/56*

U.S. Cl. 83—42 **3 Claims**

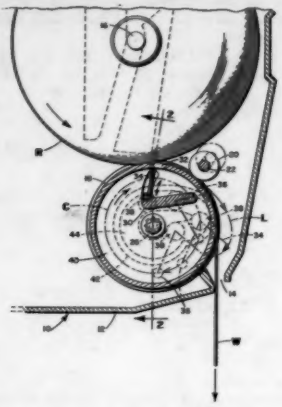
1. In a dispenser for rolls of flexible sheet material having mechanism for cutting a web of the material, a method for cutting the web comprising the steps of:

passing the web of material in an arc over an arcuate segment of a feed roller;

applying a pulling force to said web to rotate the feed roller through said arcuate segment incident dispensing flexible sheet material from the dispenser;

projecting the edge of a cutting knife in a first direction by positively driving the cutting knife from within the feed roller beyond the periphery of the feed roller while the feed roller rotates through the arcuate segment to cut the web arc passing over the feed roller; and

positively driving the cutting knife in a second direction opposite to said first direction to positively retract the



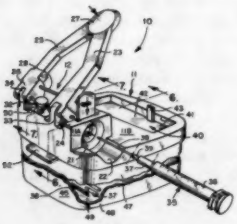
knife edge back into the feed roller incident rotation of the feed roller beyond said arcuate segment.

4,404,881

NEEDLE AND SYRINGE DESTRUCTOR

Paul H. Haniff, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.

Filed Aug. 19, 1981, Ser. No. 294,326
Int. Cl.³ B23D *15/00*; B26D *5/10*
U.S. Cl. 83—167 **16 Claims**



1. A needle and syringe destructor comprising:

a base having a first portion including shearing means and a second portion including disposal means:

said shearing means comprising

a pair of guillotine shears each having a movable shear blade and a static shear blade, said movable shear blades having a shearing edge and a linkage slot, said static shear blades having opposing guide grooves accommodating said movable shear blades and each having an access aperture both being coaxial and each having a static shearing edge capable of shearing association with a movable shear blade,

a connector means movably engaging the linkage slots of said movable shear blades,

a lever arm means in pivotal relationship with said first base portion at hinge means and having attachment means engaged with said connector means linking said lever arm means with said guillotine shears,

entry portal means coaxial with said access apertures opening adjacent to a guillotine shear and opening outwardly of said first base portion,

said disposal means comprising

an opening in said second base portion,

a movable closure lid associating with said opening,

a receptacle having a peripheral edge associating with said base in removable relationship, an open side defined by said peripheral edge opening to said first and second base portions, and sidewall and lower wall portions defining a containment chamber therebetween,

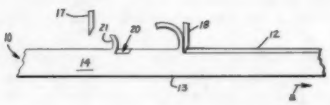
wherein a needle and syringe is insertable through said entry portal means for positioning of a needle at one of the guillotine shears and a portion of a syringe barrel at the other, whereupon said lever arm is hand manipulable to actuate said movable shear blades to traverse across access apertures of said static shear blades whereby the needle and syringe barrel are severable in one traversal, whereupon severed portions enter said containment chamber and remaining syringe barrel portions extending outwardly of said entry portal means may be deposited at said disposal means through said opening by opening said movable closure lid and depositing such portions into said containment chamber of said receptacle.

4,404,882

METHOD AND APPARATUS FOR TRIMMING ELONGATED ARTICLES

George E. Mock, Duluth, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,279
Int. Cl.³ B23D *1/26*
U.S. Cl. 83—869 **5 Claims**



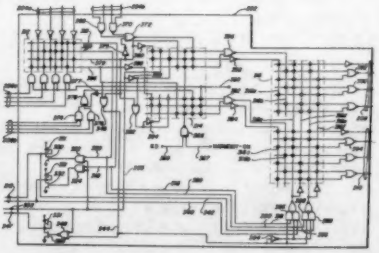
1. A method of trimming a cast metal bar of a shape having at least one elongated corner as it is being advanced along a path which method comprises the steps of periodically moving a first blade into and out of the corner of the bar thereby forming spaced notches in the corner from which curls protrude, and directing the notched metal bar corner into contact with a second blade to trim discrete corner strips spanning adjacent notches sequentially from the bar.

4,404,883

INTEGRATED HARMONY GENERATING CIRCUIT FOR ELECTRONIC ORGAN

Angelo A. Bione, Elmhurst, Ill., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed Jan. 19, 1981, Ser. No. 226,117
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. A harmony generating system for use in an electronic organ having an upper manual for generating upper manual

keying signals, a lower manual for generating lower manual keying signals and keyer circuits responsive to said upper and lower manual keying signals, said harmony generating system receiving upper manual keying signals and lower manual keying signals and having a plurality of integrated circuits with each circuit receiving said upper manual keying signals and said lower manual keying signals for at least one letter note and comprising:

octave identify means responsive to said upper manual keying signals for at least one letter note for generating an upper manual octave identify signal;

first circuit means responsive to said upper manual keying signals for at least one letter note for generating an upper manual active signal;

octave select means responsive to the absence or presence of said upper manual active signal from another one of said plurality of integrated circuits and said lower manual keying signals for at least one letter note for generating octave select signals; and

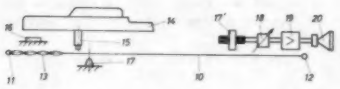
second circuit means responsive to said upper manual octave identify signal, said upper manual active signal from said first circuit means of the same integrated circuit and to said octave select signals for generating harmony signals, said harmony signals corresponding to said lower manual keying signals for at least one letter note and said upper manual keying signals for at least one letter note and being within a twelve note range above the upper manual keying signals.

4,404,884

STRINGED INSTRUMENT WITH KEYBOARD, OF THE CLAVICHORD TYPE

Ernst Zacharias, Trossingen, Fed. Rep. of Germany, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,798
Int. Cl.³ G10C *3/18*
U.S. Cl. 84—258 **4 Claims**



1. In a stringed instrument of the clavichord type employing a plurality of stretched strings, wherein each key carries a tangent which may be caused to impact against a single associated string by actuation of the key, the impact of the tangent causing the string to vibrate, each string also corresponding with a fixed stop disposed at the side of the string opposite to the tangents, the strings each also having associated therewith muting devices positioned adjacent first ends of the strings, the improvement comprising:

means positioning the key tangents at points along the individual associated strings which are off-set with respect to the point of contact between the string and stop toward the muting devices whereby a free string portion is established between each tangent and the said point of contact of its associated string with a stop.

4,404,885

MICROPHONE MOUNT FOR BASS FIDDLE

Scott W. Salak, 26151 Lakeshore Blvd., Euclid, Ohio 44132

Filed Apr. 3, 1981, Ser. No. 250,580
Int. Cl.³ G10D *3/00*; G12B *9/00*
U.S. Cl. 84—329 **7 Claims**

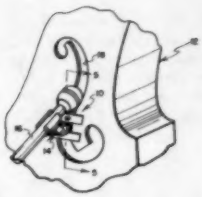
1. A microphone mount for positioning a microphone in steadied and non-shifting relationship adjacent an opening formed through a substantially planar wall of a housing of a musical instrument subjected to musical vibration and without imparting vibration-induced mechanical noise from said mount to a microphone, comprising:

(a) clamping means for sandwiching and clampingly engaging exterior and interior portions of a substantially planar wall of a musical instrument, said instrument wall portions being located on opposite sides of an opening formed through the instrument planar wall, the clamping means including:

(i) at least a pair of overlying clamping members with each member of sufficient length to extend transversely across the opening formed through the instrument planar wall to overlie said planar wall portions on either side of said opening, with at least one of said clamping members having dimensions to permit ready insertion thereof through the opening in the instrument;

(ii) resilient cushion means carried by said clamping members on the respective faces thereof confronting said instrument wall portions;

(iii) compression means accessible from one side of said clamping members and adjacent an exterior wall of the instrument for effecting relative movement of the



clamping members in directions substantially perpendicular to said instrument wall portions to bring the clamping members into clamping engagement with said instrument wall portions; and,

(b) microphone connector means carried by at least one of the clamping members for supporting a microphone rigidly adjacent said instrument when the mount is clamped thereon,

said connector means extending outwardly from said one side of said clamping members exteriorly of said instrument wall thereby to position a microphone in proximity to said instrument wall,

whereby a microphone may be readily mounted in secure relation in immediate proximity to an exterior face said musical instrument when said mount is clamped thereon and wherein said resilient cushion means in cooperation with said compression means preclude unwanted shifting movement of said mount in response to musical instrument vibration while simultaneously precluding transmission of noise-inducing vibration to said clamping members, said microphone connector means, and a microphone thereon.

4,404,886

NOTE READING OCTAVE ISOLATOR

Verna M. Leonard, 9360 N. Blackstone, Fresno, Calif. 93710

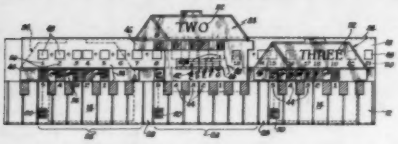
Filed Aug. 17, 1981, Ser. No. 293,555
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.
Int. Cl.³ G09B *15/02*
U.S. Cl. 84—471 R **8 Claims**

1. A note reading octave isolator comprising:

(a) a front panel having a display of a portion of a keyboard thereon with keys in a certain octave;

(b) at least one insert card insertable behind said front panel and having first and second positions assumable relative to said front panel and including means to hold said insert card in at least one of said positions;

(c) said insert card having an octave indentifier identifying said certain octave and including first and second tiers of indicia, said first tier comprising scale tone name naming by juxtaposition the scale tones of said keys and aligning with same in said first position, and said second tier displaying a group of notes on a staff generally falling within



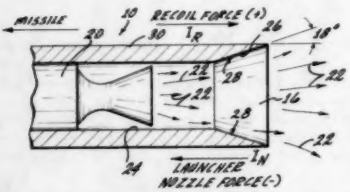
said certain octaves and being hidden behind said front panel in said first position and juxtaposed with said keys on said front panel in said second position, whereby a user can alternate between said first and second position to alternately identify notes with a range on said keyboard, or identify the keys of said keyboard.

4,404,887

RECOIL REDUCER

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 162,291, Jun. 23, 1980, abandoned.
This application Jun. 7, 1982, Ser. No. 385,520
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.816 **2 Claims**



1. In a missile launcher for filing self propelled missiles which generate an internal exhaust gas over pressure within said launcher upon firing, a recoil reducer comprising:

a single wall tubular housing having a forward end from which the missile exits upon firing and an after end from which missile exhaust gases are emitted,

the wall of the housing having any inner cylindrical surface and an outer cylindrical surface,

a truncated conical surface formed in the wall of the housing at its after end, and

wherein the conical surface extends from the after end of the outer wall surface to the inner wall surface at an angle between 10 and 20 degrees with respect to the outer wall surface, thus forming an outwardly flared surface against which the missile exhaust gases impinge when exiting the housing.

4,404,888

OBTURATOR SYSTEM

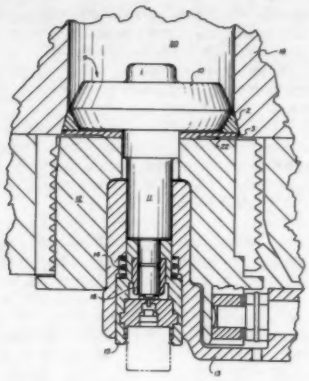
Joseph A. Gentiluomo, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 13, 1981, Ser. No. 310,944
Int. Cl.³ F41F *11/00*
U.S. Cl. 89—26 **6 Claims**

1. An obturator system functionally mounted between the tube and breechblock of a cannon, comprising:

(a) an annular disc spring mounted against the front face of said breechblock.

(b) an annular seal ring having a base surface slidably engaged with said disc spring, an outer sealing surface oriented to align itself with said tube's gas check seat when said breechblock is in the closed position, and an inner sealing surface;



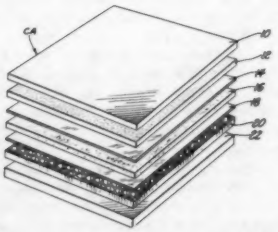
(c) and a spindle having integral mushroom head and shaft, with said shaft slidably mounted within said breechblock, and said mushroom head having a wedging surface oriented for making slidable contact with said inner sealing surface of said seal ring.

4,404,889

COMPOSITE FLOOR ARMOR FOR MILITARY TANKS AND THE LIKE

Anthony S. Miguel, Leucadia, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,295
Int. Cl.³ F41H *5/04*
U.S. Cl. 89—36 A **17 Claims**



15. A novel composite armor assembly adaptable for use in belly hulls and walls of various vehicles to protect its personnel and other vital compartments, said composite armor assembly comprising plural intermediate layers of various kinetic-energy-absorbing media of differing densities contained between innermost and outermost layers of armor steel plate; said intermediate layers including media layers of balsa wood, steel honeycomb, and an at least semiflexible reinforced ballistic-resistant fabric, and wherein said layer of balsa wood is planar in form and approximately the same thickness as said innermost steel plate, with said balsa wood layer being cut and disposed so that its grain is essentially perpendicular to major planes of

the assembled composite layers and is essentially parallel to the major force direction of a potential explosive shock wave load.

4,404,890

FIRE CONTROL SYSTEM

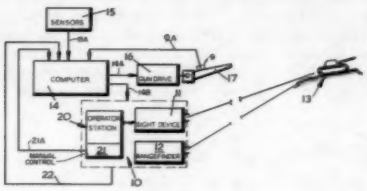
Frederick W. McAlpine, Bearsden, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

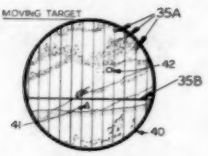
Continuation of Ser. No. 88,453, Oct. 22, 1978, abandoned. This application Feb. 26, 1982, Ser. No. 352,932

Claims priority, application United Kingdom, Nov. 2, 1978, 43015/78

Int. Cl.³ F41G *3/06*

U.S. Cl. 89—41 E **1 Claim**





1. A fire control system for a gun, comprising

a gun drive mechanism;

a sighting device having a ballistic aiming mark;

a ballistic computer arranged to compute fire control signals from parameter-dependent input signals;

sensor means for establishing individual electrical input signals from respective environmental and ballistic parameters;

operator-actuated means associated with said sighting device for establishing individual electrical input signals from respective target-dependent parameters; and

means for applying the input signals established by said sensor means and said operator-actuated means to said computer;

wherein said sighting device comprises a visual display on which a sighting mark and first and second images are presented in superimposition, said first image being from a field of view and said second image being from a dual-mode electronic pattern generator which when operable in one of said modes establishes said ballistic aiming mark; said electronic pattern generator when operable in the other of said modes establishing a predetermined pattern in the form of a set of parallel lines arranged to move as a body substantially continuously over said visual display in the direction of an orthogonal line;

and said operator-actuated means comprises manually-actuable means for altering the field of view of said sighting device; rate means operable by a single operator-actuated rate controller for setting the rate of movement of said set of lines on said visual display; orientation means operable by a single operator-actuated orientation controller for setting the orientation of the orthogonal line on said visual display; and a laser rangefinder device for determining the range of a target in said field of view with said sighting mark aligned thereon;

the arrangement being such that, in operation, a moving target has its direction of movement parameter determined by the orientation controller when said orthogonal line is aligned on the visual display with the target movement direction and its rate of movement parameter determined by the rate controller when said set of lines move over the visual display in synchronism with the target movement, the field of view being held stationary during determination of said movement parameters, the range parameter being subsequently determined by the rangefinder device after alteration of the field of view so that the sighting mark is aligned with the target, said range, rate and direction parameters being determined independently of each other during operation of the pattern generator in said other mode and establishing individual electrical input signals for said ballistic computer, said computer having means to cause said pattern generator to establish said ballistic aiming mark on the visual display for positioning by the fire control signals on receipt of the range parameter input signal, the gun drive mechanism being thereafter actuated to align the aiming mark on the target prior to firing of the gun.

4,404,891

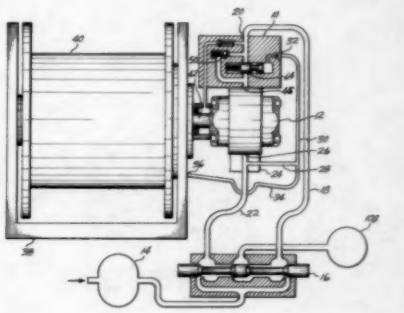
BRAKE VALVE FOR A HYDRAULICALLY POWERED WINCH

Edwin W. Turnquist, and Rick J. Bentley, both of Tulsa, Okla., assignors to Paccar Inc., Bellevue, Wash.

Filed Aug. 18, 1980, Ser. No. 179,186

Int. Cl.³ F15B *15/26*

U.S. Cl. 91—45 **9 Claims**



1. An improved brake valve for a winch or the like having a drum powered by a rotary hydraulic motor and having a drum brake, comprising:

said motor having a drum lowering inlet for receiving pressurized fluid for lowering a load when the drum brake is released, said drum brake having a brake release port for receiving pressurized fluid to release the drum brake;

a housing having a plurality of cavities and passageways therein;

a check valve permitting the flow of hydraulic fluid through the valve in one direction when the winch is being used to raise a load and means for biasing the check valve toward a closed position;

a fixed area orifice for metering the flow of fluid into a spool bore in the housing when the winch is being used to lower a load;

a spool disposed for reciprocating motion between open and closed positions within said bore and means for biasing said spool toward the closed position, said spool cooperating with said spool bore to provide an annular restrictive passageway therebetween and said spool further cooperating with an orifice cavity in said housing to provide a variable area orifice, said fixed area orifice creating a pressure drop upstream of said variable area orifice;

means coupling the drum lowering inlet, the brake release port and the spool of said brake valve for simultaneously receiving pressurized fluid for lowering the load, releasing the drum drake and for urging said spool into an open position;

a damper piston disposed for reciprocating motion within a damper piston bore in said spool and tending to retard the movement of said spool toward an open position, a flow-restricting, damping orifice communicating with said damper piston bore, said damper piston blocking passage of fluid movement out of said damper piston bore but allowing fluid to pass out of said damping orifice to damp movement of said spool;

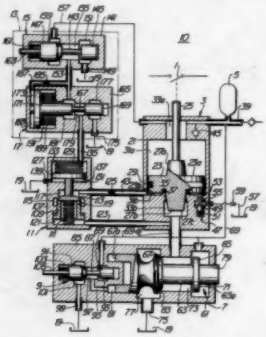
and radially expandible friction producing means disposed between said spool and said spool bore and engageable therewith for retarding the movement of said spool, said friction producing means tending to reduce the sensitivity of said valve to transient pressure changes.

4,404,892

HYDRAULIC OPERATING APPARATUS

Ichiro Nakamura; Mitsuaki Takenoshita, both of Katsuta; Ken Ichiryu, Mito; Yoshimichi Akasaka, and Haruo Watanabe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,844
Claims priority, application Japan, Dec. 27, 1979, 54-169253
Int. Cl.³ F15B *15/22*
U.S. Cl. 91—396 **9 Claims**



1. A hydraulic operating apparatus comprising:

an actuating cylinder;

a piston movable in said actuating cylinder and provided on one side with a piston rod; and

a control valve for applying a fluid under high pressure to a pressure receiving surface of said piston on the side of said piston opposite to the side provided with said piston rod to move said poston in a direction in which the piston rod extends from the piston and for discharging the fluid existent on the side of the piston opposite said piston rod to move said piston in a direction opposite the direction in which the piston rod extends from the piston;

wherein the improvement comprises:

sealing means for dividing the pressure receiving surface of the piston on the opposite side of said piston rod into a first pressure receiving surface section and a second pressure receiving surface section when the piston is disposed at its terminal position on the side of said piston opposite said piston rod, said first pressure receiving surface section having an effective pressure receiving area smaller than that of a pressure receiving surface of the piston on the side of said piston rod, whereby the fluid under high pressure is only applied to said first pressure receiving surface section when said piston is held at its terminal position at the side of the piston opposite the piston rod, and the fluid under pressure is applied to said first and second pressure receiving surface sections when said piston is moved away from its terminal position opposite the piston rod; and

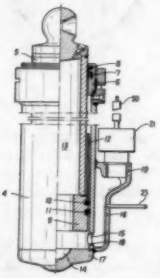
a pilot-operated check valve provided in a fluid passage communicating a first fluid chamber with a second fluid chamber when said piston is disposed in its terminal position opposite the piston rod, said first fluid chamber facing said first pressure receiving surface section and said second fluid chamber facing said second pressure receiving surface section, said pilot-operated check valve being oriented for executing an opening movement in a direction opposite to a direction of flow of the fluid under high pressure from said first fluid chamber to said second fluid chamber and being adapted to be forcedly opened temporarily by the action of a pilot fluid pressure for moving the piston away from its terminal position opposite the piston rod to thereby cause the fluid under high pressure acting on said first pressure receiving surface section to act also on said second pressure receiving surface section.

4,404,893

HYDRAULIC MINE PROP

Siegfried Sigott; Heinrich Suessenbeck; Alfred Zitz, all of Zeltweg, and Gottfried Siebenhofer, Vienna, all of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 719,652, Sep. 1, 1976. This application Mar. 17, 1978, Ser. No. 887,774
Claims priority, application Austria, Sep. 9, 1975, 6947/75
Int. Cl.³ F15B *15/22*
U.S. Cl. 91—405 **1 Claim**



1. A hydraulic mine prop comprising an inner tubular prop for supporting a mine roof guided within an outer tubular prop, said inner prop having an open end disposed within the outer prop and facing toward a closed end of the outer prop, said inner prop operating as a piston working in the outer prop as in a cylinder, the interior space of said inner prop communicating freely with a fluid pressure working chamber in said outer prop, said outer prop having an orifice at the circumference thereof at said closed end, said orifice being open on one side to the working chamber and being open on its other side to a pocket which is rigidly secured onto the outer surface of said outer prop, a threaded bore in the outer surface of the upper end of said pocket, an externally-mounted pressure-responsive roof fall valve secured in said threaded bore in the upper end of said pocket in a position generally parallel to said outer prop, said roof fall valve having an outlet passage which discharges pressure medium from said working chamber when the valve is in its opened position thereby enabling the inner prop to move into the outer prop under an increasing roof pressure, the cross-sectional area of said orifice equalling at least the passage area of said roof fall valve in its open position, and the end of the inner prop directed towards the working chamber being slidable when fully lowered over the orifice to

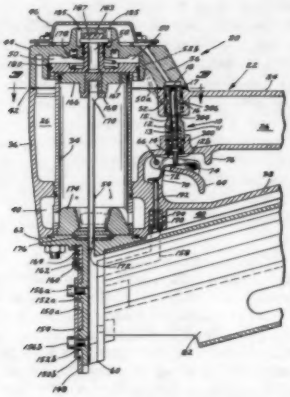
thereby throttle the latter, said end having at least one sealing ring provided thereon at such an axial location as not to obstruct said orifice when said inner prop is moved into said outer prop the maximum distance, and means for connecting said mine prop to a source of fluid pressure.

4,404,894

VALVE TRIGGER ASSEMBLY FOR PNEUMATIC NAILER

Helmut Oesterle, Tosters, Austria, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Aug. 27, 1980, Ser. No. 181,951
Int. Cl.³ F15B *13/042*
U.S. Cl. 91—461 **8 Claims**



1. Valve trigger assembly for a pneumatic nailer including a pneumatic system having a cylinder assembly, a piston assembly mounted within said cylinder assembly and having a driver blade attached to said piston assembly in said cylinder assembly, a poppet assembly covering said cylinder assembly, and said valve trigger assembly connected between a supply line of air pressure and said pneumatic system in a housing of said nailer, said valve trigger assembly comprising:

a. valve bushing including a geometrically configured bushing, threads positioned on a lower end of said bushing for engagement in said nailer, a geometrically configured outer diameter including a plurality of small holes in a mid-portion of said bushing and a plurality of large holes in an upper portion of said bushing, a geometrically configured inner diameter including an enlarged inner diameter in said lower portion of said bushing and a groove in a substantially lower portion of said enlarged inner diameter;

b. valve piston including a longitudinal member, an upper mid-position of a slightly reduced diameter, a lower portion including an enlarged diameter having finite width which engages with said enlarged inner diameter of said bushing, and a valve stem extending downward of substantially reduced diameter from said enlarged diameter; hexagonal sided top on said valve bushing, a slot running between opposing intersections of said sides of said hexagonal top and a key of rectangular configuration engages in said housing and locks one of said hexagonal sides to said housing;

c. biasing and retaining means including a spring positioned over a lower portion of said valve piston above said enlarged diameter of said valve piston and within said enlarged inner diameter, and a snap ring retainer engaged into said groove, said spring biasing said enlarged diameter of said valve piston downwardly against said enlarged inner diameter of said valve bushing, and said retainer ring engaged into said groove of said valve bushing retaining said spring and valve piston therein; and,

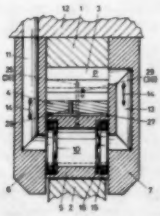
d. ring means including a plurality of o-ring grooves and o-rings selectively positioned about said bushing on said upper and lower portions, and o-ring grooves and o-rings selectively positioned about said valve piston at least one o-ring groove and o-ring on a mid-portion of said valve piston and including an o-ring groove and an o-ring in an upper portion of said reduced diameter of said valve piston, said valve bushing o-ring grooves and o-rings include two o-ring grooves and o-rings on each side of said holes of said upper portion of said valve bushing, and an o-ring groove and o-ring on said lower portion adjacent said threads on said lower portion, said o-ring on said valve piston is positioned slightly below said plurality of holes, said o-ring moves a slight distance for blocking and isolating said small holes, said o-ring adjacent the top of said valve piston is positioned a lesser distance from the top of said valve bushing than said o-ring on said valve piston is positioned below said plurality of holes, said lower o-ring blocks and isolates said holes after said large holes communicate with atmosphere, whereby said valve trigger assembly provides for air passage of air supply line pressure from said plurality of small holes to said plurality of large holes between said two o-rings of said valve piston through a channel for charging a poppet assembly of said nailer when said valve piston is in a downwardly biased position in said valve bushing, and provides for passage of air pressure through channels above said poppet assembly to the atmosphere on actuation of said valve stem of said valve piston in reverse biasing said valve piston upward in said valve bushing where said lower o-ring about said valve piston isolates and blocks said plurality of small holes and said pressure above said poppet assembly flows through channels in said pneumatic tool, through said plurality of large holes, and up along said reduced diameter of said valve piston to the atmosphere thereby providing for firing of said nailer and subsequent dispensing of a nail.

4,404,895

FLUID PRESSURE UNIT WITH HYDROSTATIC TORQUE TRANSMISSION BY ROLLER PISTONS

Ivan J. Cyphelly, Neuhaus, CH-8128 Hinteregg, Switzerland

Filed May 12, 1980, Ser. No. 150,222
Claims priority, application Switzerland, May 18, 1979, 4687/79
Int. Cl.³ F01B *1/06*
U.S. Cl. 91—488 **2 Claims**



1. In a pressure fluid pressure unit having a cylinder block which has radial bores of rectangular cross section in which pistons are disposed, each of which has a piston cap periodically exposed to pressure of a medium and a cylindrical roller supported on the piston cap, and having a cam surrounding the cylinder block producing at least one stroke and upon which the rollers are supported, each roller forming a variable gap with a first of two side walls, perpendicular to the direction of rotation, of a respective said radial bore, wherein each said piston cap forms a sealing point with the second of the two side

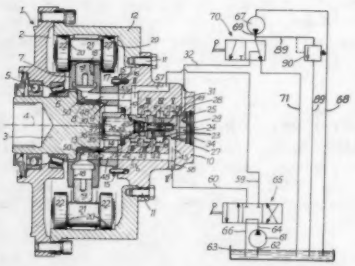
walls, wherein a respective intermediate pressure chamber exposed to the pressure of the medium is located between the variable gap and the piston cap along the first side wall, and wherein the rollers are hollow and their hollow spaces are exposed to the pressure of the medium via channels which terminate in the side walls, parallel to the direction of rotation, of the radial bores, the improvement wherein for each said roller (5) a first channel (11) terminating in the one side wall (6), parallel to the direction of rotation, of a respective said radial bore (3) is intended for communication with a pressure source of the medium and a second channel (13) terminating in the other side wall (7) parallel to the direction of rotation communicates with a pressure chamber (at p) of said respective radial bore (3) located on the side of the piston cap (4) remote from a respective said roller (5) in such a manner that a respective said hollow space (10) of said respective roller (5) is exposed to flow through it of the medium acting upon a corresponding said piston cap (4) and further comprising axially yielding sealing rings (15, 16) disposed between end faces of each said roller (5) and said two side walls (6, 7) of said respective radial bore (3) which are parallel to the direction of rotation.

4,404,896

PRESSURIZED FLUID ENGINE EQUIPPED WITH MEANS FOR SELECTING ITS SPEED OF ROTATION

Bernard R. Allart; Jean-Claude Lallier, both of Crepy-en-Valois, and Alain W. Noël, Verberie, all of France, assignors to Poclain Hydraulics, France

Filed Apr. 8, 1981, Ser. No. 252,152
Claims priority, application France, Apr. 30, 1980, 80 09854
Int. Cl.³ F01B *13/06*
U.S. Cl. 91—491 **7 Claims**



1. A pressurized fluid engine system comprising:
a rotary cylinder block mounted for rotation about an axis of rotation;
first and second groups of radial cylinders provided in said rotary cylinder block;
a piston mounted for movement in each of said cylinders to define a work chamber of variable volume;
a plurality of fluid passageways in said rotary cylinder block with each of said fluid passageways communicating on one end with the work chamber of one of said cylinders and having an open outer end in a transverse plane face of said cylinder block oriented perpendicularly to the axis of rotation of said cylinder block and with each open outer end being equidistantly spaced from each other and said axis of rotation;
a source of pressurized work fluid;
a sump;
a first fluid control valve;
a three-position fluid control valve;
first and second main supply conduits extending between said first fluid control valve and said second fluid control valve;
said three-position fluid control valve including selectively movable means movable to a first position for connecting said first main supply conduit to said source of pressurized work fluid and said second main supply conduit to said sump and to a second position for blocking the first and second main supply conduits and to a third position for connecting said first main supply conduit to said sump and said second main supply conduit to said source of pressurized work fluid; and wherein
said first fluid control valve includes a valve housing, a piston valve mounted for axial positioning in a housing bore in said valve housing in a first position for directing pressurized work fluid to the fluid passageways in said rotary cylinder block to both groups of said cylinders to achieve low speed operation of said engine in a first direction when said three-position fluid control valve is in its first position or in a reverse direction when said three-position fluid control valve is in its third position and a second position for directing pressurized work fluid to only a selected one of said groups of cylinders to achieve high speed operation of said engine when said three-position fluid control valve is in its first position or in a reverse direction when said three-position fluid control valve is in its third position while simultaneously providing substantially unpressurized work fluid to the cylinders of the non-selected group of cylinders.

4,404,897

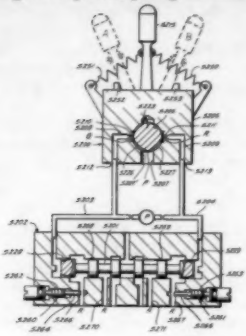
FLUIDIC REPEATER

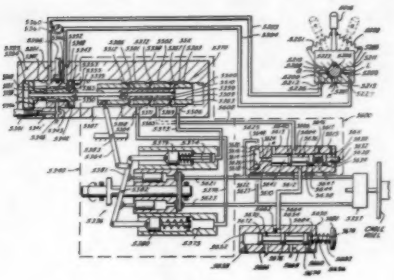
Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Continuation of Ser. No. 772,560, Feb. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 622,760, Oct. 15, 1975, Pat. No. 4,094,229, which is a continuation-in-part of Ser. No. 521,036, Nov. 11, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Apr. 6, 1979, Ser. No. 27,668
Int. Cl.³ F01B *3/00*; F15B *9/10*
U.S. Cl. 91—506 **51 Claims**

1. A fluidic repeater system comprising:
a source of fluid under pressure;
a first and a second fluid restrictor;
a first fluid passage connected to said source through said first fluid restrictor;
a second fluid passage connected to said source through said second fluid restrictor;
a reservoir of fluid having a pressure less than that of the fluid of said source;
transmitter means for variably venting both said first and said second passages to said reservoir in such a manner that one of said fluid passages can be variably vented by said transmitter means while the other of said fluid passages is not vented by said transmitter means;
said transmitter means being positionable, while the second passage is not vented, in a first stationary position of low venting of the first passage and a second stationary position of increased venting of the first passage and a plurality of stationary positions between said first and second stationary positions in which said first passage is vented differing amounts;
said transmitter means being positionable, while the first passage is not vented, in a third stationary position of low venting of the second passage and a fourth stationary position of incresed venting of the second passage and a plurality of stationary positions between said third and fourth stationary positions in which said second passage is vented differing amounts; and
first responder means including a first piston in a cylinder for providing mechanical displacement of said first piston with respect to said cylinder in response to change in the differential of the pressure of the fluid in said first passage and the pressure of the fluid in said second fluid passage,

said transmitter means in each of said stationary positions venting the respective passage an amount which is invariant with respect to changes in the relative positions of the responder piston and cylinder.



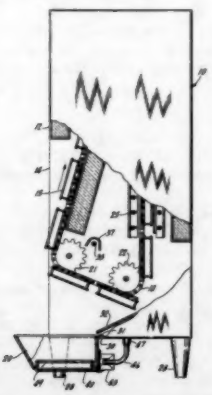


4,404,898

TOASTER WITH PRODUCT WARMER

Roderick J. Chaudoir, Fox Point, Wis., assignor to Hatco Corporation, Milwaukee, Wis.

Filed Aug. 7, 1981, Ser. No. 291,014
Int. Cl.³ A47J 27/62
U.S. Cl. 99—331 **10 Claims**



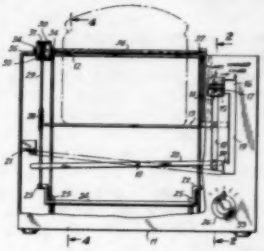
1. A food cooking and warming system comprising means for cooking a food product and a food product receiving tray associated therewith and adapted to receive food from said cooking means, means for warming the food received in said tray consisting of an electrical heating element means located above said tray and arranged for directing radiant heat onto said tray and a heating blanket means affixed to the exterior of said tray and adapted for warming said tray.

4,404,899

TOASTERS

Joseph Weiss, 134 W. 93rd St., New York, N.Y. 10025

Filed Apr. 11, 1980, Ser. No. 139,192
Int. Cl.³ A47J 37/08
U.S. Cl. 99—332 **16 Claims**



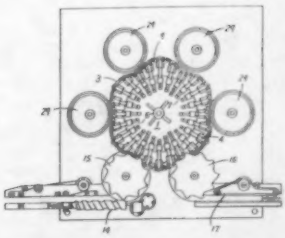
1. In a device, such as a toaster, having an open slotted receptacle, a control lever, a movable rack affected by said control lever, a movable member and a rotatable member, said members being coupled to each other and whereby said coupling permits some movement of either of said members without affecting the other of said members, and whereby when said movement of either of said members is greater than said coupling permits, the other member is affected, and when said control lever is activated in one direction, said control lever affects said movable rack, said movable member and said rotatable member to effect the covering of said receptacle and when said control lever is activated in the opposite direction, said receptacle is uncovered.

4,404,900

APPARATUS FOR MULTIPLE COLOR PRINTING OF ARTICLES WITH TAPERED SURFACES

Kazumi Ozawa, Koga, and Shinichiro No, Hooya, both of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Feb. 27, 1981, Ser. No. 239,122
Claims priority, application Japan, Feb. 28, 1980, 55-24365
Int. Cl.³ B41F 17/20
U.S. Cl. 101—40 **4 Claims**



1. A continuous multicolour printing apparatus for printing stepwise in multicolor the tapered surfaces of conical or truncated-conical articles which are successively fed and conveyed at a constant speed, the apparatus comprising:

(A) a conveyor unit adapted to convey articles to be printed at a constant speed which includes a rotary disc having a plurality of bearings mounted on the outer periphery thereof, a first rotating shaft for rotating the disc, a conveyor chain arranged to be moved along a predetermined conveying locus or path, a second rotating shaft located within a first sprocket means driven by a prime mover and adapted to drive said conveying chain, a plurality of tilting support means each adapted to support an article to be printed, a plurality of third freely rotating support shafts each mounted in one of said bearings, said tilting support means each having an arm adapted to be slidably fitted into one of said third rotatable shafts, said tilting support means each being inclined by an angle corresponding to the degree of taper of the articles to be printed, a cradle for receiving said articles to be printed and having a fourth rotatable shaft, a power transmission shaft flexibly connected to said fourth rotatable shaft, said first rotating shaft of the rotary disc being arranged to rotate in synchronism with the rotation of said second rotating shaft and said first sprocket means;

(B) cradle rotating units each including a fixed plate having a similar configuration to said predetermined conveying locus, a fixed chain stretching around a major part of the outer periphery of said fixed plate, a second sprocket means arranged to rotate said cradle and meshing with said fixed chain so as to be rotated therealong thereby rotating said power transmission shaft of said second sprocket means rotating said power transmission shaft of said second sprocket means and said fourth rotatable shaft of said cradle connected to said power transmission shaft;

(C) a plurality of rotary printing means disposed along the conveying locus or path of the articles to be printed;

(D) a feeding unit for supplying articles to be printed to said conveyor unit; and

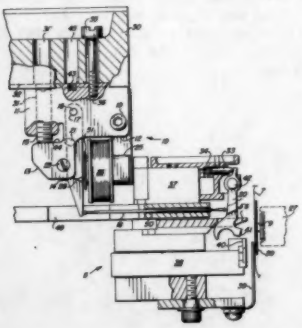
(E) a delivery unit for delivering printed articles from the appartus, and that all the rotating means of said units set forth in (A) to (E) above are arranged to rotate in synchronism with one another.

4,404,901

STRIKER ASSEMBLY FOR LINE PRINTERS

Richard L. Funkhouser, Melbourne, Fla., assignor to Documation Incorporated, Palm Bay, Fla.

Filed Feb. 26, 1979, Ser. No. 15,213
Int. Cl.³ B41J 9/42
U.S. Cl. 101—93.02 **11 Claims**



1. In a high speed printer having a plurality of hammers utilized in a printing operation and a plurality of associated striker assemblies supporting striker armatures for driving said hammers against a moving character band during such printing operating, a striker assembly comprising in combination:

a striker base having a body portion and a head portion attached to said body portion by a narrow neck section;

a striker armature attached at a pivot point to said striker base;

a self-aligning cylindrical backstop disposed in said head portion and aligned with said striker armature for maintaining said armature in a desired non-operated position; and

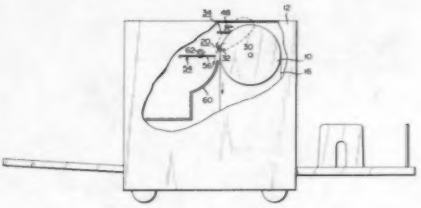
external adjustment means for adjusting said backstop to maintain said armature in such desired non-operated position during normal operation of said printer.

4,404,902

ROTARY DUPLICATING MACHINE WITH AUTOMATIC STENCIL PAPER DISCHARGE

Juichi Horii; Shuichi Nakajima, both of Tokyo, and Eiji Takahashi, Yokohama, all of Japan, assignors to Horii Toshado Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,480
Claims priority, application Japan, Sep. 2, 1981, 56/136978
Int. Cl.³ B41L 13/08; B41F 15/08
U.S. Cl. 101—122 **5 Claims**



1. A rotary duplicating machine comprising a rotary screen formed into an endless belt, a bit of cut stencil paper including a head somewhat thicker than a main body thereof and clamped to the rotary screen, and an automatic stencil discharging device operative after the completion of the printing operation to release the clamped head of the bit of cut stencil paper, and raise the released head from the rotary screen, the automatic stencil discharge device including a pair of opposite stencil takeup pawls disposed outside of both edges of the rotary screen to be spaced from the rotary screen in a direction perpendicular to a portion thereof near to the pawls and having an operating positions where the pawls carry the raised head of the bit of cut stencil paper therebetween, then are rotated to wrap the bit of stencil paper about the head thereof carried between the takeup pawls, the pair of stencil pawls being retracted to an inoperative position after the wrapping of the bit of stencil paper to discharge the wrapped bit of stencil paper therefrom.

4,404,903

AUTOMATED SCREENER

John V. Cronin, 2215 Port Lerwick, Newport Beach, Calif. 92660

Continuation of Ser. No. 103,755, Dec. 14, 1979, abandoned.
This application Feb. 5, 1982, Ser. No. 346,661
Int. Cl.³ B41L 13/18
U.S. Cl. 101—123 **30 Claims**

1. In a screener in which a chase for framing a stencil screen and having front, rear and side edges, is pivotally secured at its rear edge so as to be pivotally movable relative to a table surface, from an open position permitting a workpiece to be placed on, or withdrawn from, the table surface, to a closed position in which the screen will be in contact with the workpiece during a print stroke whereby, in the closed position, printing fluid on a first end of the screen can be spread by a squeegee and applied to the workpiece through the screen

during a print stroke, whereby thereafter the chase can be moved from the closed position and the printing fluid can be swept back by a squeegee to the first end during a stroke, the improvement according to which operation of the screener is automated comprising:

means for moving the chase to and from the open and closed positions;

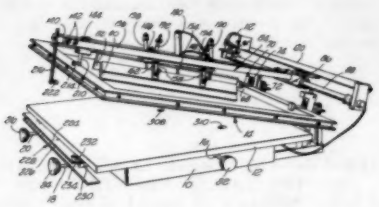
means for supporting a print squeegee and a flood squeegee over the screen whereby the bottom edge of the flood squeegee is a predetermined distance below the supporting means and whereby the print squeegee is movable below and above the bottom edge of the flood squeegee,

means for driving the print and flood squeegees toward alternate side edges sequentially in print and flood strokes, respectively;

means for raising the print squeegee above the bottom edge of the flood squeegee after the print stroke;

means for raising the chase to bring the screen and the bottom edge of the flood squeegee into contact; and

means for raising the support means with the chase after the flood stroke to enable removal of said work piece.



4,404,904

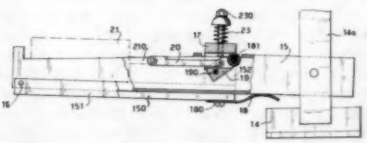
AUTOMATIC SILK-SCREEN PRINTING MACHINE INCLUDING AN ELECTROMAGNET DEVICE FOR MOVING THE DOCTOR BLADE DOWNWARDS

Jacques Monvoisin, Paris, France, assignor to Societe Tecal, France

Filed Dec. 21, 1981, Ser. No. 332,638

Int. Cl.³ B05C *17/06;* **B41F** *15/08*

U.S. Cl. 101—126 **2 Claims**



1. An automatic silk-screen printing machine including means for synchronized control of movements comprising a relative linear movement between the screen and the doctor blade, a downward movement of the doctor blade and a simultaneous upward movement of the member which holds the object to be printed, in which the mechanism for moving the doctor blade holder **(14)** downwards and upwards includes an electromagnet which controls the downward movement of the doctor blade, characterized in that said mechanism comprises a pivoting arm **(15)** the pivot point **(16)** of which is fixed relative to the means for linearly moving the doctor blade, means **(18)** for yieldingly returning said arm to a position corresponding to the up position of the doctor blade, a member **(17)** having an abutment surface above said arm, means **(23)** for applying a downward vertical pressure onto said abutment surface; a link **(19)** having a pivot pin **(190)** integral with said arm and at one end of which is mounted the axle of a wheel **(191)** bearing against said abutment surface, a rod **(20)** connected at one end thereof to said link so as to cause it to oscillate about its pivot pin, and said electromagnet **(21)** which has a movable member integral with the opposite end of said rod and means for causing energization of the electromagnet throughout the printing period.

4,404,905

VERSO PRINTING UNIT IN THE DELIVERY OF A SHEET-FED ROTARY PRINTING PRESS

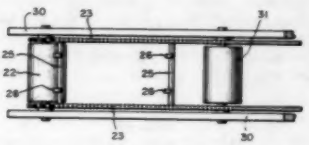
Claus Simeth, Offenbach am Main; Oskar Liebert, Westheim, and Klaus Theilacker, Friedberg, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 374,149, May 3, 1982, abandoned. This application Jul. 2, 1982, Ser. No. 395,141

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117856

Int. Cl.³ B41F *5/16*

U.S. Cl. 101—183 **7 Claims**



1. An apparatus for printing the back side of a sheet being fed from a sheet-fed printing press unit into a delivery unit comprising, in combination, a frame, guide rails in the frame, a pair of conveyor chains laterally spaced from one another on the guide rails to form an endless loop conveyor extending from the press unit to a delivery pile, the chains having cross members at regular intervals, grippers at the cross members for gripping the leading edge of a sheet, the guide rails being arranged to form a delivery run and return run spaced apart and generally parallel to one another, an impression cylinder journalled in the frame between the runs in a position in which it is overlapped by each of the runs but having an axial length which is shorter than the lateral spacing between the chains, a blanket cylinder journalled in the frame outside of the delivery run and in rolling engagement with the impression cylinder, a plate cylinder having inking and dampening systems and in running engagement with the blanket cylinder, the circumference of the cylinders being equal to the spacing between the successive cross members and grippers, the impression cylinder having a longitudinal groove sufficiently large to provide free passage for the cross members and associated grippers in both the delivery and return runs, and means for driving the cylinders in synchronism with the conveyor chains so that a sheet passing on the grippers is engaged between the impression and blanket cylinders for application of a printed impression to the sheet.

4,404,906

SYSTEM FOR CONTROLLING FAN-OUT IN A WEB OFFSET PRESS

Thomas F. Curran, 460 N. Main St., Wauconda, Ill. 60084

Filed May 18, 1981, Ser. No. 264,634

Int. Cl.³ B41M *1/14*

U.S. Cl. 101—211 **2 Claims**

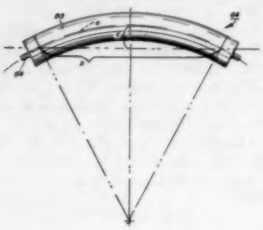
1. A method for controlling fan-out in a web offset press, which comprises the steps of:

providing first, second and third printing units, each of which printing units includes a plate cylinder and a blanket cylinder;

applying ink to the plate cylinders;

delivering a web to the blanket cylinders;

interposing, at a wrap angle of between 60° and 180°, a bowed roller, having a bow that is between 0.02 percent and 0.08 percent, transverse the web immediately upstream of the blanket cylinder of the first printing unit



only without any tensioning device intermediate the bowed roller and the blanket cylinder, prior to delivery of the web to the blanket cylinder of the first printing unit, for applying outward lateral forces to the web to expand the web laterally prior to printing thereon by the blanket cylinder of the first printing unit.

4,404,907

WEB THREADING APPARATUS FOR ROTARY PRINTING MACHINES

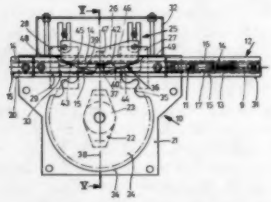
Ingo Köbler, Gessertshausen, and Johann Winterholler, Friedberg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed May 5, 1981, Ser. No. 260,687

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018740

Int. Cl.³ B41F *13/02*

U.S. Cl. 101—228 **11 Claims**



1. In combination with a rotary printing machine a web threading apparatus for use in the rotary printing machine comprising

a track **(12)** having guide rails, including an inner guide rail **(15)**, and an outer guide rail **(14)** parallel to the inner guide rail and spaced therefrom;

a roller chain **(11)** having a leading end, positioned in said track, sliding on at least one of said guide rails, guided by the guide rails, and having attachment means **(13)** for attachment thereto of a web **(9)** of material to be threaded into the printing machine,

and a sprocket wheel **(24)** adapted to receive the leading end portion of the chain and to then engage in the links between the rollers of the roller chain, said sprocket wheel extending through one of the guide rails into the space between both of the guide rails **(14, 15)** of said track in a section thereof,

and means to permit reliable interengagement of the sprocket wheel projecting in the space between the guide rails with the leading end portion of the chain, said means including a movable rail element **(36)** located in said section, and

spring means **(46)** retaining said movable rail element in a normal position forming a continuation of the outer guide rail of the track and capable of resilient deflection in a direction transverse to the direction of movement of the chain when the chain is being fed in the track toward the sprocket wheel for engagement with the leading end portion of the chain, and being returned from deflected position to permit reliable interengagement of the sprocket wheel with the roller chain regardless of relative position of the chain and sprocket wheel upon initial contact therebetween.

4,404,908

ARRANGEMENT FOR SUPPLYING INK TO THE PRINTING PLATE OF A PRINTING PRESS

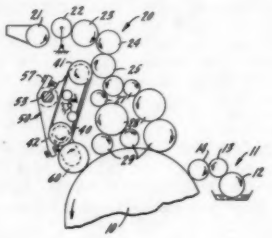
Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jun. 21, 1982, Ser. No. 390,276

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125434

Int. Cl.³ B41F *7/24, 31/00*

U.S. Cl. 101—349 **6 Claims**

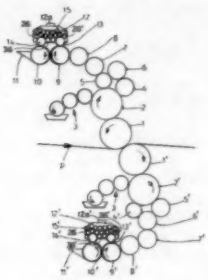


1. In an inking system for a lithographic printing press, the combination comprising a main frame, a plate cylinder journalled in the main frame and having a plate mounted thereon, the plate having a non-ink accepting column position, a source of dampening fluid having means for applying dampening fluid the width of the plate, a source of ink, an ink form roller in rolling engagement with the plate, means including a series of rollers for conveying a film of ink from the source to the form roller for applying ink the width of the plate accompanied by a tendency toward emulsification of the ink on the form roller in the non-ink accepting column position, the conveying means also including an ink drum interposed early in the series of rollers, a relatively narrow endless ink belt presenting a flat ink-accepting surface in the non-ink accepting column position, a pair of correspondingly narrow guide rollers widely spaced from one another for supporting the belt in an elongated loop, a subframe for journalling the guide rollers, means for mounting the subframe on the main frame including provision for lateral adjustment of position, one end of the loop being in ink-transferring relationship with the printing plate at a position adjacent the downstream side of the form roller to remove from the plate ink, particularly any emulsified ink, which may be applied by the form roller to the non-ink accepting areas in the column position, the other end of the loop being in ink-transferring relationship to the ink drum for constantly transferring the removed ink to the drum thereby to prevent contamination of non-inked areas of the plate in the non-ink accepting column position.

4,404,909
INK SUPPLY ARRANGEMENT FOR AN OFFSET PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 186,533, Sep. 12, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,623
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942734
The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.
Int. Cl.³ B41F *31/14, 31/26*
U.S. Cl. 101—350 18 Claims



1 In an offset printing machine having an inking system including

an ink trough (11);

an ink duct roller (10) receiving ink from the ink trough (11);

a transfer roller (9) receiving ink from the ink duct roller (10) and positioned in ink film transferring relation to the ink duct roller;

and a plurality of ink distribution rollers (4-8) receiving ink from the transfer roller (9), said ink transfer roller (9) and the ink distribution rollers (4-8) forming an ink roller train,

in which the ink duct roller (10) is operating at a circumferential speed which is low with respect to the circumferential speed of the ink transfer roller (9) and the ink distribution rollers (4-8);

apparatus preventing accumulation of ink or ink pools, and to remove water-ink emulsion from the ink train,

comprising

a cage-like holder (12) having confining end walls (26), side walls (16) and a closed bottom wall (36);

first and second ink transferring rollers (13, 14) having an ink accepting surface projecting from the cage-like holder;

and a plurality of loose roller elements (15) freely, centerless floatingly located in the cage-like holder for centerless self-positioned rolling movement between the confining walls and the bottom wall of the cage, some of the roller elements being in surface engagement with said ink transferring rollers (13, 14) and some of the roller elements being in surface engagement with each other to increase the surface area of ink being transported in the ink train,

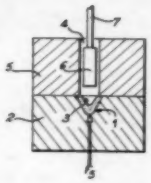
the plurality of roller elements being of such number that the distance between the ink transferring rollers (13, 14) within the cage-like holder (12) is spanned by at least some of the roller elements, and which will assume positions between the ink transferring rollers, the plurality of roller elements (15) being rotated by surface frictional engagement with the ink transferring rollers (13, 14);

and wherein said cage-like holder (12) is positioned in said printing machine for engagement of one (14) of the ink transferring rollers with the ink duct roller (10) and for engagement of the other of the ink transferring rollers (13) with one (9) of the rollers of the roller train (4-8; 9) to place said ink transferring rollers (13, 14) and the roller elements (15) therein in an ink and water-ink transferring path between the ink duct roller (10) and the ink transfer roller (9) which is in parallel to the path of ink from the ink duct roller (10) to the said one roller (9) of the roller train (4-8; 9).

4,404,910
MULTICHANNEL CONNECTION AND METHOD FOR TRANSMITTING PYROTECHNIC ORDERS

Jules H. P. Devienne, Sartrouville, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 26, 1980, Ser. No. 210,816
Claims priority, application France, Dec. 3, 1979, 79 29658
Int. Cl.³ C06C *5/06*
U.S. Cl. 102—200 6 Claims

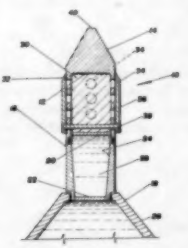


1. A multichannel connection making it possible to transmit pyrotechnic orders to a plurality of pyrotechnic chains having multiple functions forming part of a pyrotechnic logic used on board aircraft, missiles and launchers, wherein it is constituted by a detonating cutting cord in the form of a dihedron incorporated into a support provided with the same number of openings as there are transmitting channels which, on the basis of one pyrotechnic signal performs a plurality of different terminal functions.

4,404,911
SELF-SPARGING INERTIA ARMED NOSE FUZE

Frank H. Bell, Logan, and John A. Peterson, Brigham City, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 5, 1981, Ser. No. 318,664
Int. Cl.³ F42C *15/38*
U.S. Cl. 102—221 7 Claims



1. An explosive device comprising a housing having a cavity formed therein and including a plurality of ventillation ports for the cavity,

a movable sleeve normally covering a sealing said ventillation ports, and

a desensitized liquid explosive contained within said cavity, the desensitizing constituent of said liquid explosive being a volatile solvent absorbed therein,

whereby upon movement of said sleeve and uncovering of said ventillation ports said volatile solvent is allowed to evaporate and thus render said solvent desensitized liquid explosive sensitive, thereby arming said explosive device.

4,404,912

CHAFF CARTRIDGE FOR AIRCRAFT DEFENSE

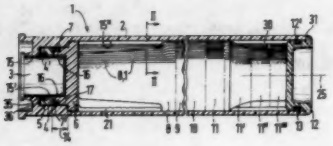
Paul Sindermann, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,123

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015719

Int. Cl.³ F42B *9/02*

U.S. Cl. 102—505 **10 Claims**



1. A cartridge for ejecting chaff dipoles for use in an aircraft defense system to disrupt enemy radar, said cartridge comprising:

(a) a shell for receiving a plurality of chaff dipoles, said shell having a base portion and an open mouth portion;

(b) a plurality of chaff dipoles, said dipoles having at least first and second portions;

(c) a pressurized gas cartridge mounted in the base of the cartridge for expelling said dipoles through said open mouth portion;

(d) a first piston means mounted between said gas cartridge and said chaff dipoles, said first piston means having axially and forwardly extending spaced apart leg means that contact the inner walls of said cartridge and a portion of said dipoles, said piston and leg means retaining said first portion of chaff dipoles in their initial loaded position for a predetermined portion of their flight path after ejection;

(e) a second piston means closing the mouth of said cartridge, said second piston having rearwardly and axially extending leg means for retaining said second portion of the dipoles after ejection:

whereby the pressurized gas ejects the first piston, the chaff dipoles and said second piston to form an elongated pattern of dispersion a predetermined distance from said aircraft.

4,404,913

TAMPING TOOL ASSEMBLY

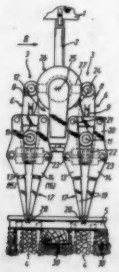
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbauma-Schinen-Industriegesellschaft mbH, Vienna, Austria

Filed Oct. 7, 1981, Ser. No. 309,244

Claims priority, application Austria, Jan. 22, 1981, 260/81

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **8 Claims**



1. A tamping tool assembly arranged on a mobile track tamping machine for simultaneously tamping ballast underneath three successive track ties resting on the ballast, the track having two rails fastened to ties having elongated edges extending transversely of the track and adjacent ones of the elongated tie edges defining cribs therebetween, the machine including a frame and the tamping tool assembly including

(a) a tamping tool carrier associated with each one of the track rails in vertical alignment therewith and mounted for vertical movement on the machine frame, each track rail defining a vertical plane extending in the direction of the track,

(b) two vibratory tamping tool supports mounted on the carrier for pivoting about an axis extending perpendicularly to the vertical plane, each support having an upper end and a lower end, and each support extending perpendicularly to, and on both sides of, the vertical plane to the left and to the right of the associated track rail,

(c) a common drive for vibrating the tamping tool supports, the upper support ends being linked to the common vibrating drive,

(d) two pairs of tamping tools mounted on the lower ends of each one of the supports and arranged mirror-symmetrically with respect to the vertical plane, the pairs of tamping tools mounted on one of the supports being spaced from the pairs of tamping tools mounted on the other support in the direction of the track and the spacing being such that the pairs of the tamping tools mounted on each support are in vertical alignment with a respective one of two successive ones of the cribs between the three successive track ties, the tamping tools of each pair being immersible in the respective crib upon vertical downward movement of the carrier, and

(e) drive means mounted on each one of the supports for reciprocating the tamping tools of each pair towards and away from the elongated tie edges defining the respective cribs.

4,404,914

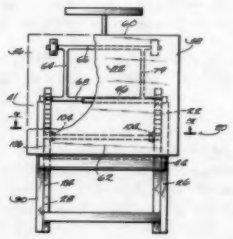
DRAWING TABLE AND EASEL CONVERSION

Max F. Taylor, Rte. 1, Bradley Rd., Whitewater, Wis. 53190

Filed Aug. 20, 1981, Ser. No. 294,669

Int. Cl.³ A47F *5/12*

U.S. Cl. 108—9 **15 Claims**



1. A folding table comprising:

A. at least two pairs of first and second pivotally attached crossed legs, joined by transverse brace members to form a folding base;

B. stop means defining the limit of unfolding of said base;

C. a removable tabletop having a top surface, a bottom surface, first and second opposed edges, and a central portion between said edges;

D. first rack means extending along the upper ends of said first legs;

E. a strut having one end pivotally attached to said tabletop bottom surface near said first edge and the other end received by said first rack means to support said first edge;

F. second rack means extending along the bottom surface of

said tabletop substantially from said second edge to said central portion; and

G. a transversely extending bar supported by the upper ends of said second legs and received by said second rack means to support said econd edge.

4,404,915

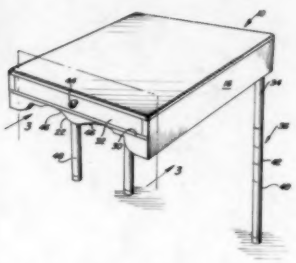
PORTABLE DESK-WORK BENCH

Lewis H. Simpson, 101 Hilborn Ave., #18, Vallejo, Calif. 94590

Filed Dec. 18, 1980, Ser. No. 217,792

Int. Cl.³ A47B *37/00*

U.S. Cl. 108—43 **2 Claims**



1. A work surface defining horizontal assembly for use by seated persons, said assembly including a horizontal upper surface defining a work surface, said assembly including remote transverse front and rear marginal portions, depending front legs supported from said assembly adjacent the opposite end portions of said front transverse marginal portion, the rear marginal portion of said assembly including transversely spaced downwardly facing abutment surface portions for engagement with and support from the upwardly facing upper surfaces of the horizontal upper leg portions of a seated person, said assembly defining a downwardly opening cavity, said legs and assembly including coacting means for upward folding of said legs into retracted positions within said cavity, said assembly including a rear leg dependingly supported from the central portion of the rear marginal portion of said assembly, said rear leg being considerably shorter than said front legs and disposed in a front to rear extending vertical plane disposed between said abutment surface portions, the lower end of said rear leg being shaped to abut and be supported from the central forward marginal portion of a seat upon which the user of said assembly is seated with said rear leg being downwardly received between the upper leg portions of the user, said rear leg and assembly including coacting means for upward folding of said rear leg into retracted position within said cavity, said rear leg and said front legs being foldable upwardly into front to rear extending positions within said cavity, said abutment surfaces being arcuate, extending longitudinally of said rear marginal portion and opening downwardly, said front legs, when folded, being disposed outwardly of remote sides of vertical front to rear extending planes containing the remote end portions of said arcuate abutment surface portions and said rear leg being disposed in a front to rear extending vertical plane spaced between the adjacent ends of said arcuate abutment surfaces.

4,404,916

MULTIPLE ENTRY CLOSURE FOR A SAFE OR VAULT

Bert M. Ingram, Santa Paula, Calif., assignor to Ingram Security Inc., Santa Paula, Calif.

Filed Dec. 22, 1980, Ser. No. 218,538

Int. Cl.³ E06B *7/00*; E05B *13/00*

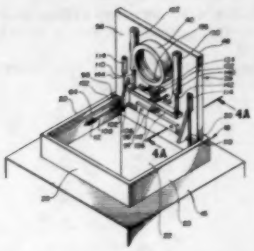
U.S. Cl. 109—67 **13 Claims**

1. A multiple entry closure for a safe wherein at least one surface of said safe is accessible and exposable comprising:

a collar secured to said one exposable surface extending outwardly therefrom and said collar defining an opening therethrough communicating with the interior of said safe and having an outer edge surface;

a door having inner and outer generally co-planar surfaces and the periphery of said door corresponding with said opening within said collar and said door hingedly mounted therein, so that when said door is opened full access may be had to the interior of said safe;

said door including a reduced size opening extending therethrough of lesser peripheral area than said door;



a locking means cooperating with said door and said collar whereby said door may be locked to said collar and in turn close a majority access area of said safe;

said locking means being accessible only through said reduced size opening when said door is in a closed position;

a lift-out removably mountable door within said reduced size opening including a locking means including bolt members adapted to engage a portion of said door and retain said lift-out door in said reduced size opening and in turn fully close said safe and when said door is removed allowing limited access to the interior of said safe.

4,404,917

METHOD AND DEVICE FOR PLANTING PLANTS

Reijo S. Häkli, Iso-Vimma, Finland, assignor to Lännen Tehtaat Oy, Iso-Vimma, Finland

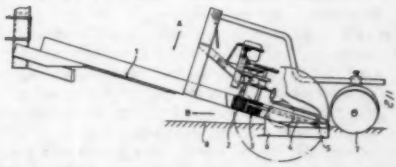
PCT No. PCT/FI80/00003, § 371 Date Jun. 15, 1981, § 102(e) Date Jun. 15, 1981, PCT Pub. No. WO81/01351, PCT Pub. Date May 28, 1981

PCT Filed Oct. 28, 1980, Ser. No. 276,377

Claims priority, application Finland, Nov. 13, 1979, 793547

Int. Cl.³ A01C *11/02*

U.S. Cl. 111—3 **11 Claims**



1. A method for planting pot plants with a planting machine travelling on the ground, comprising the steps of driving the machine along the ground, forming a planting furrow, feeding one of the plant pots into a rotary planting means of the planting machine, grasping the plant pot in a generally vertical position with a pair of opposed belts of the planting means having vertical faces, moving the plant pot down towards the planting furrow with the belts, throwing the plant pot from the planting means into the planting furrow with the plant stem above the ground level, depositing the plant pot directly into the furrow from the planting means, closing the furrow when the plant pot has attained a substantially vertical position in the

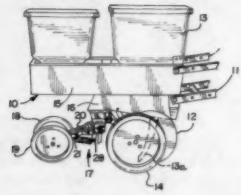
planting furrow as the plant pot abuts soil being pressed into the furrow during closing of the furrow, disengaging the plant pot from the planting means when the component of the speed of the planting means and the plant in relation to the planting machine, which component is opposite to the travelling direction of the planting machine, is at least 1.5 times greater than the speed of the planting machine in relation to the ground surface.

4,404,918

CLOSING WHEEL MOUNTING FOR A PLANTER

Bernard F. Whalen, Colchester, and Clifford J. Roberts, Roseville, both of Ill., assignors to Yetter Manufacturing Co., Colchester, Ill.

Filed Sep. 14, 1981, Ser. No. 301,730
Int. Cl.³ A01C *5/06*
U.S. Cl. 111—85 **1 Claim**



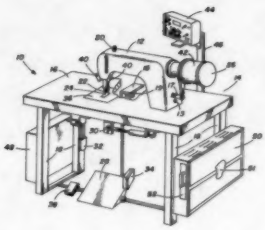
1. An agricultural seed planter including
(a) a main frame attachable to a mobile power source;
(b) furrow forming means depending from said main frame;
(c) seed dispensing means including a seed delivery tube associated with said planter adapted to deposit seeds within the furrow;
(d) furrow closing means disposed rearwardly of said seed delivery tube including a pair of suspension arms, each arm pivotally connected to said main frame at one end, a pair of closing wheels, each wheel carried by and journalled on the other end of the respective suspension arms, biasing means exerting pressure on said arms to cause downward movement thereof, each wheel disposable on an opposite side of said furrow whereby each arm and associated closing wheel is movable up and down upon the pivotal movement of the respective suspension arms;
(e) each of said closing wheels disposed at a laterally inclined angle to the ground;
(f) means associated with at least one of said closing wheels and suspension arms to selectively vary the angle between sid closing wheel and ground;
(g) said means including a bushing in said other end of the suspension arm, said bushing having an obliquely disposed shaft therein mounting said wheel, and clamping means for fixing said bushing in the suspension arm, said means to vary the angle between said closing wheels and ground simultaneously resulting in an adjustment of the distance between said closing wheels at the point where said closing wheels engage the ground upon rotating said bushing;
(h) an equalizer connection between said suspension arms, said biasing means being anchored at one end to said equalizer connection, said equalizer having portions associated with each of said suspension arms, one said portion of the equalizer extending through each suspension arm and another portion of the equalizer overlying each suspension arm, said equalizer and biasing means being adapted to urge each said arm and associated wheel to a ground engaging position, and said biasing means and equalizer causing said closing wheels to apply substantially equal pressure at each side of the furrow irrespective of the relative levels of such sides.

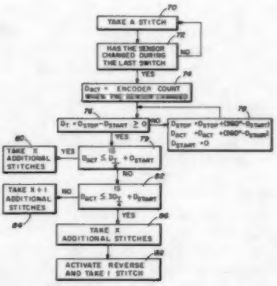
4,404,919

CONTROL SYSTEM FOR PROVIDING STITCH LENGTH CONTROL OF A SEWING MACHINE

Charles R. Martell; Elmer N. Leslie; Don D. Isett, all of Dallas, and Stephen S. Treadwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 210,197, Nov. 26, 1980, which is a continuation-in-part of Ser. No. 168,525, Jul. 14, 1980, Pat. No. 4,359,953. This application Jun. 29, 1981, Ser. No. 278,674
Int. Cl.³ D05B *19/00*
U.S. Cl. 112—121.11 **29 Claims**





7. A seam length control apparatus for use on a machine having a reciprocable stitching member comprising:
means for detecting the edge of the material in advance of the seam being stitched,
means for detecting the amount of completion of the stitch being formed at the time of detection of the edge of the material, and
means responsive to said detecting means for varying the length of only the last stitch formed in the seam by a variable amount.

4,404,920

SEWING AID DEVICE

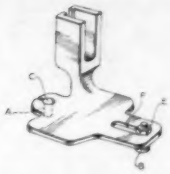
Jakob Pfuhl, Punchbowl, Australia, assignor to Katarina Pfuhl; Ingrid Pfuhl and Kate Models Pty., Limited, all of Punchbowl, Australia

Division of Ser. No. 498,948, Aug. 20, 1974, Pat. No. 4,240,367. This application Oct. 17, 1979, Ser. No. 85,484
Claims priority, application Australia, Aug. 27, 1973, PB.4645
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.15 **7 Claims**

1. A sewing aid device for the manufacture of closed or substantially closed clothing items, such as pockets or collars, comprising:
frame means adapted to hold together in fixed relative position items to be stitched together;
guide means adapted to engage with cooperating guide means on a sewing machine in such manner as to permit

automatic guiding of the sewing mechanism of the sewing machine along said guide means;

an enclosed base member surrounding a central aperture and provided with means for retaining portions of material to be stitched together in fixed relative position; and



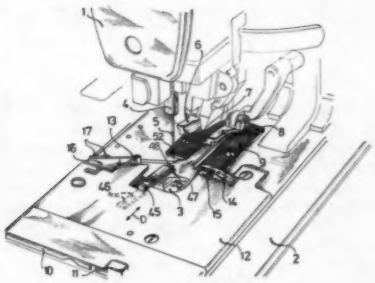
a guide member adapted to be fitted closely over said base member and to guide the sewing mechanism of a sewing machine whereby the portions of material may be stitched together.

4,404,921

BUTTONHOLE MACHINE WITH AUTOMATIC THREAD CLIPPING

Eberhard Kastrup, and Heinz-Rolf Oberschelp, both of Bielefeld, Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,472
Int. Cl.³ D05B 65/02
U.S. Cl. 112—291 **10 Claims**



1. In a buttonhole machine having:

a vertically reciprocal needle;

a horizontally displaceable material support plate;

a rotary stitch plate below said needle;

means for feeding a lower thread up through said stitch plate;

clamps for holding material on said material plate at said stitch plate; and

means for rotating said stitch plate in one rotational sense, simultaneously displacing said material plate, and reciprocating said needle to form a buttonhole in said fabric and for rotating it in an opposite return rotational sense after formation of the buttonhole; the improvement comprising:

means including a feed arm carried by and jointly rotatable with said stitch plate, engaging said lower thread, and pivotal for freeing a length of said lower thread and feeding same to said stitch plate;

a pivotal blade carried by said material plate;

a fixed blade on said material plate and engageable with said pivotal blade; and

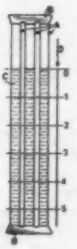
control cam means at least partially on said stitch plate for pivoting said blade during return rotation of said stitch plate to sever said lower thread and for synchronously pivoting said feed arm to make slack in said lower thread.

4,404,922

AGEING INDICATOR

Bruno P. Morane, Neuilly, and Gilbert L. Legras, Chatillon, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 28, 1980, Ser. No. 173,237
Claims priority, application France, Aug. 3, 1979, 79 19954
Int. Cl.³ G01D 21/00; G04F 1/04
U.S. Cl. 116—206 **17 Claims**



1. An ageing indicator intended to be physically associated by affixation or placement or placement with merchandise whose ageing-phenomenon-characteristic and age is and are disired to be evaluated, wherein:

the indicator consists of at least one closed envelope which defies a single compartment; in which

said at least one closed envelope in said indicator is constituted of a plastic material of construction that is selected from the Group consisting of: polyethylene; polypropylene; polyvinyl chloride; polymers of acrylonitrile; polymers of ethylene terephthalate; polystyrene; acetate polymers; and elastomers; with

said at least one closed envelope being in the form of at least one tube means or sachet of a plastic material of construction as defined in the foregoing; and also wherein

it is intended to give only one indication of the ageing of the merchandise to be monitored, this indication consisting of information printed on the indicator; and further with

said tube means or sachet being of a closed construction which has two large faces thereon, one of which large faces carries information whilst the other large face through which said information is read is transparent; and

at least one opaque fluid product being contained in said at least one envelope, said opaque fluid product being selected from the Group consisting of: water; colored solvents; and opaque emulsions which become transparent on the elimination of a volatile constituent;

said opaque fluid product being further capable of migrating to the outside of said at least one envelope in which it is contained and therethrough so as to traverse at least part of the said at least one envelope;

said opaque fluid product being still further capable of generating the said migrating fluid; and

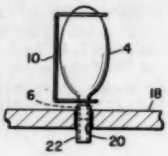
the migration of fluid occurring as a function of time involved during the migration and the ambient temperature or temperatures affecting said merchandise; whereby

the ageing of the associated merchandise can be evaluated by mere sighting of the relevant said information printed and thereupon capable of appearing on the said indicator faces.

4,404,923
HEAT ALARM INDICATOR

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Filed Jul. 14, 1981, Ser. No. 283,278
Int. Cl.[3] G08B 5/40, 17/00; A62C 37/14
U.S. Cl. 116—214 9 Claims

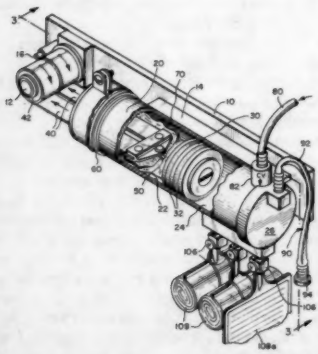


1. A heat alarm indicator comprising: a container having at one end thereof an elongated breakable neck portion; an odoriferous fluid within the container that can escape from the container upon breakage of said neck portion of said container, said fluid when in contact with the atmosphere creating a strong odor; and a heat reactive member that bends upon being subjected to heat above a preselected level, said heat reactive member having first and second portions, with said first portion forming a loop around said neck portion of said container so that when subjected to heat above said preselected level, said heat reactive member bends and breaks said neck portion for enabling said fluid to escape, said second portion of said heat reactive member being formed around another portion of said container.

4,404,924
BODY FLUID SUCTION DEVICE INDICATORS

Edward M. Goldberg, Glencoe, and Seymour Bazell, Skokie, both of Ill., assignors to UreSil Company, Morton Grove, Ill.

Filed Sep. 5, 1980, Ser. No. 184,235
Int. Cl.[3] A61M 1/00; G01L 19/12
U.S. Cl. 116—270 7 Claims



1. A suction device for receiving body fluids comprising:

container means including a constant force moveable wall means for defining a suction chamber adapted to maintain a subatmospheric pressure and to receive body fluids:

a vacuum indicator comprising a flexible tube which is closed at one end by a preselected mass, said tube movable between a rest state, in which the interior volume of the tube has a first value, and a collapsed state, in which the interior volume of the tube is substantially less than the first value;

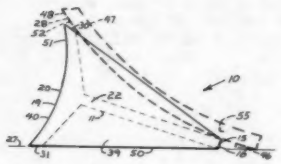
means for mounting the tube to the container means such that the interior volume of the tube is in fluid communication with the suction chamber;

the flexibility of said tube being chosen such that the tube collapses to the collapsed state when a subatmospheric pressure less than a first predetermined value is induced in the suction chamber, and the tube returns to the rest state when the pressure in the container means rises to a value greater than a second predetermined value, greater than the first predetermined value, such that the tube provides a visual indication of the pressure in the suction chamber.

4,404,925
AIR HOSE GUIDE

Kevin R. Louwsma, 1019 Sarita St., Sanford, Fla. 32771

Filed Oct. 27, 1980, Ser. No. 200,903
Int. Cl.[3] B05C 11/00
U.S. Cl. 118—506 6 Claims

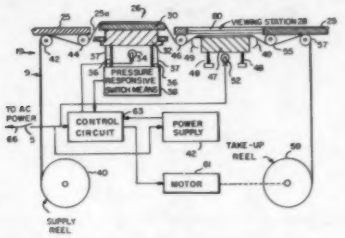


1. A paint sprayer air hose guide for use between the tire tread of a wheel of a vehicle being spray painted and the supporting surface therefor, said air hose guide comprising a flat planar web portion having a transversely extending rear side edge that is adapted and arranged to be wedged between said supporting surface and said tire tread, a transversely extending front side edge that is generally forwardly offset from said rear side edge, and a pair of oppositely facing surfaces that are generally located between the rear and front side edges of the web portion, a first flange portion which extends along said front side edge and projects laterally of one of said oppositely facing surfaces, said first flange portion being adapted and arranged to rest upon said supporting surface and support the web portion in a forwardly inclining position when said one of said oppositely facing surfaces confronts said supporting surface, a second flange portion which extends along said front side edge and projects laterally of the other of said oppositely facing surfaces, said second flange portion being adapted and arranged to rest upon said supporting surface and support the web portion in a forwardly inclining position when said other of said oppositely facing surfaces confronts said supporting surface, said first and second flange portions being adapted and arranged to provide a transversely extending air hose contact surface along said front side edge for guiding movements of an air hose thereat, said first flange portin having an edge that is adapted and arranged to contact said supporting surface when said first flange portion is resting thereon, said second flange portion having an edge that is adapted and arranged to contact said supporting surface when said second flange portion is resting thereon, and the edges of the first and second flange portions being located in respective planes which intersect the plane of the web portion along a line that is located in back of the rear side edge thereof.

4,404,926
APPARATUS FOR RECORDING SURFACE TOPOLOGY

Mark H. McCormick-Goodhart, Grosse Pointe Woods; Vincent D. Cannella, Detroit, and Robert Minko, East Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 937,432, Aug. 21, 1978, which is a continuation-in-part of Ser. No. 890,601, Apr. 14, 1977. This application Oct. 8, 1981, Ser. No. 309,577
Int. Cl.³ B05B 5/00; B41K 1/00
U.S. Cl. 118—641 15 Claims



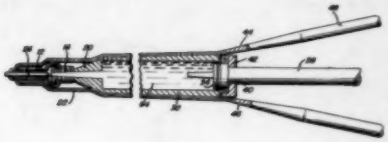
1. A recording system for recording the surface topology of a given surface, said recording system comprising a platform transparent to electromagnetic energy; a recording film extending over one side of said platform which recording film comprises an electromagnetic imaging energy transparent substrate upon only one side of which is deposited a thin, solid, high optical density film of dispersion imaging material which, upon application of electromagnetic energy to a given point thereof for a given momentary period and in an amount which produces undissipated heat in the imaging material of a certain critical value changes at such point to a fluid state in which the surface tension of the imaging material acts to cause the substantially opaque film to disperse and change to a discontinuous film comprising light-passing openings and deformed material which are frozen in place after termination of electromagnetic energy, the substrate side of the recording film facing said platform; a source of said electromagnetic energy on the other side of said platform for directing said energy through said transparent platform and substrate of said recording film upon said body of imaging material; and means for selectively causing said source of energy of said amount to be directed said given momentary period through said platform into said recording film, the application of a surface to be recorded upon the outer imaging material containing side of said recording film during the entire period said energy is applied thereto having a heat-sinking effect on said recording film, where the projecting portions of said surface will dissipate the heat generated at the points involved in said body of imaging material by said amount of electromagnetic energy, to reduce the undissipated heat energy therein below said critical value which will cause the imaging material to disperse.

4,404,927
LEASH WITH REMOTE LATCH RELEASE

Wilson A. Woutat, 1025 Perry Dr., NW., Canton, Ohio 44708

Filed Nov. 18, 1981, Ser. No. 322,653
Int. Cl.³ A01K 27/00
U.S. Cl. 119—114 6 Claims

1. An elongated tether member including a main elongated flexible tubular body, an anchor sleeve carried by each end of said body, one of said anchor sleeves supporting anchor structure therefrom including at least one movable component thereof shiftable between operative anchoring and inoperative release positions, an operator shiftably supported from the other sleeve for movement between active and inactive positions, and motion transmitting means disposed within said tubular body establishing at least a one-way motion transmitting connection between said operator and movable component functional to shift the latter from the operative position to the inoperative position thereof responsive to movement of said operator from said inactive position to the active position thereof, said tether member including an outer flexible tubular housing disposed about said tubular member and including opposite ends anchored relative to said sleeves, said tubular body being longitudinally stretchable, said outer flexible tubular housing comprising a diamond braided fabric tubular member, said fabric tubular member being longitudinally stretchable a limited amount and being constructed in a manner

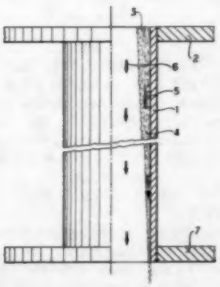


whereby it is reduced in both inside and outside diameter as it is longitudinally stretched, said tubular body establishing a limit of reduction of the inside diameter of said tubular member and thus a limit of longitudinal stretching of said tubular housing, said tubular body being constructed of yieldable and deformable material whereby said tubular body defines a yieldable limit of longitudinal stretching of said tubing housing, said motion transmitting means including piston means in each of said sleeves and fluid column means disposed in said tubular body acting upon said piston means.

4,404,928
METHOD OF EVAPORATING A PURE LIQUID

François Perot, Paris; Jacqueline Pouderoux, Meudon la Foret, and Jacques Diez, Massy, all of France, assignors to Stein Industrie, Velizy-Villacoublay, France

Filed Mar. 9, 1982, Ser. No. 356,548
Claims priority, application France, Mar. 9, 1981, 81 04602
Int. Cl.³ F22B 1/02
U.S. Cl. 122—32 3 Claims



1. A method of evaporating a pure liquid by indirect heat exchange between it and a hotter fluid, said method comprising the step of flowing said liquid under the effect of gravity along a heat exchange surface from the top to the bottom with the vapour formed flowing in the same direction as the liquid, the improvement comprising adjusting the liquid flow speed as a function of the heat exchanged via the heat exchange surface so that at least half of the liquid has evaporated by the time the remaining liquid reaches the bottom of the heat exchange surface.

4,404,929

LIQUID DISTRIBUTOR HEAD ACTUATED BY FLUID PRESSURE

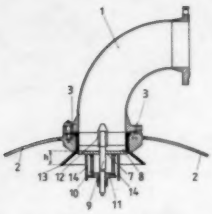
Andreas Brand, Wettingen, and Rudolf Datz, Klingnau, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 197,119, Oct. 15, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,818

Claims priority, application Switzerland, Nov. 8, 1979, 9999/79

Int. Cl.³ F22D *1/00*

U.S. Cl. 122—412 **3 Claims**



1. A liquid distributor head, especially for a mixing pre-heater and degasifier of a steam power plant, comprising:

means defining a pre-heater having a preheater housing with an upper housing portion;

a liquid infeed bend provided for said upper housing portion; said bend having a mouth portion;

a spray device, arranged at the mouth portion of said bend, for spraying a liquid flow stream into the pre-heater;

a substantially truncated cone-shaped deflection screen provided for said spray device;

said spray device embodying a valve comprising a valve plate, valve spring and spring plate, said valve spring and said spring plate being arranged beneath said valve plate, said valve being arranged internally of the mixing pre-heater and substantially centrally of said deflection screen but externally of the liquid flow stream; and

a substantially ring-shaped protective housing means, surrounding said valve spring and bearing against said valve plate, for preventing broken spring pieces from dropping into the mixing preheater and additionally protecting said valve spring from immersion in the liquid flow stream.

4,404,930

METHODS AND APPARATUS FOR TRANSFERRING LIQUID AGAINST HIGH PRESSURE RESISTANCE

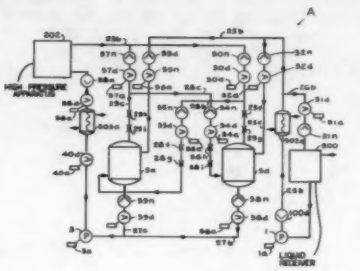
Thomas Y. C. Chen, 40 Beacon Ave., Jersey City, N.J. 07306

Continuation-in-part of Ser. No. 23,334, Mar. 23, 1979, Pat. No. 4,211,188, and a continuation-in-part of Ser. No. 841,490, Oct. 12, 1977, Pat. No. 4,165,718. This application Jul. 7, 1980, Ser. No. 166,450

Int. Cl.³ F22D *5/26*

U.S. Cl. 122—451 R **4 Claims**

1. A high efficiency energy saving condensate feeding system for feeding condensate into a high pressure vapor generator of more than 80 PSIG vapor pressure, comprising a first high pressure vessel with an expansion adjustable internal shell and an external shell and a second high pressure vessel filled with the same find of vapor as is generated by said generator and said vapor in said first vessel being high pressure vapor, a high pressure vapor source, means for changing condensate into said second vessel to fill said second vessel up to a substantial liquid level in said second vessel, means for selectively isolating said second vessel, a vapor distributor with multiple openings under the liquid level in said second vessel, means for releasing high pressure vapor in said first vessel into said second vessel and to inject said vapor into the condensate in said second vessel through said vapor distributor for reducing the vapor pressure by condensing a portion of said vapor, means for charging said condensate from said second vessel into said first vessel, means for isolating said first vessel from said second vessel, means for bleeding high pressure vapor from said high pressure vapor source into said first vessel to build up a pressure head in said first vessel for assisting condensate feeding into said generator, means for charging said condensate from said first vessel into said generator until said first vessel is selectively drained while said vapor bleeding means is selectively in operation; and means for selectively isolating said first vessel from said high pressure vapor source.



4,404,931

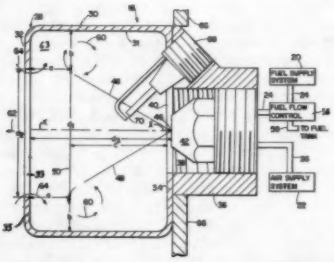
STABLE FUEL BURNER FOR PREHEATING INTAKE AIR OF INTERNAL COMBUSTION ENGINE

Joel D. Smith, Columbus, and Joseph M. Johnson, Nashville, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 959,650, Nov. 13, 1978, abandoned. This application Nov. 10, 1980, Ser. No. 205,099

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—179 H **19 Claims**



1. A fuel burner for forming a flame resistant to blow out due to cross or counter flow of ambient air, said fuel burner comprising:

(a) a combustion chamber including a first portion having a first interior surface shaped as a surface of revolution and a second portion positioned at one end of said first portion to extend perpendicularly to said first portion in a radial direction toward the axis of revolution of said first interior surface to form an end wall, said end wall having positioned therein a single central outlet aperture, said single central outlet aperture being positioned symmetrically with respect to said axis of revolution so that the center of said aperture coincides with said axis of revolution, said central aperture forming the sole path for fluid passage through said end wall; and

(b) injector means for injecting fuel into said combustion chamber, said injector means including a nozzle means

positioned along said axis of revolution at a point within the combustion chamber opposite said second portion for forming an atomized conical spray pattern symmetric with said axis of revolution, said atomized conical spray pattern having an apex positioned at said nozzle means and a base positioned inwardly from said aperture at both a first predetermined distance in an axial direction from said outlet aperture and a second predetermined distance in a radial direction from said first interior surface, the location of the base of said conical spray pattern creating a toroidal zone within said combustion chamber positioned concentrically around said axis of revolution between said conical spray pattern and said interior surface and a low pressure zone within said combustion chamber between said central aperture and said base, causing combustion products simultaneously to recirculate in a toroidal flow pattern within said toroidal zone and to flow through said outlet aperture along an exit flow path, further causing a counterflow of ambient air to be drawn into said low pressure zone through said single outlet aperture.

4,404,932

PREHEATING SYSTEM FOR DIESEL ENGINES

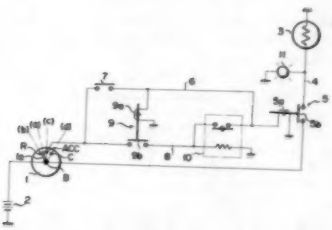
Tadao Nakamura, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 28, 1982, Ser. No. 392,697

Claims priority, application Japan, Jun. 29, 1981, 56-95112; Mar. 26, 1982, 57-41920; Mar. 31, 1982, 57-44979

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—179 H **7 Claims**



1. A preheating system for a diesel engine of the direct fuel injection type, comprising:

connection means for an electric power source;

key switch means connected with said connection means for said electric power source, said key switch means having at least first and second output terminals wherein, when said key switch means is switched over to the first output terminal, the first output terminal connects with said connection means for said electric power source and when said key switch means is switched over to the second output terminal, the diesel engine is caused to be started;

electric suction heater means for heating suction air into the diesel engine, said electric suction heater means being selectively connected with and disconnected from said connection means for said electric power source;

a lamp connected with said heater means;

first relay means disposed in a circuit between said electric suction heater means and said connection means for said electric power source, said first relay means being normally-open and adapted to be closed when excited;

a push-button switch disposed in a circuit between the first output terminal of said key switch means and said first relay means;

timer means connected with said push-button switch for selectively connecting and disconnecting said first relay means with and from said first output terminal of said key switch means; and

means for selectively connecting and disconnecting said timer means with and from the first output terminal of said key switch means, said means being connected with said push-button switch and disposed in a circuit between said timer means and the first output terminal of said key switch means.

4,404,933

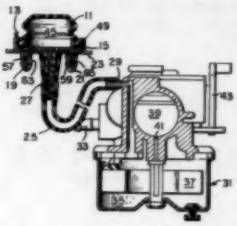
SELF-MOUNTING PNEUMATIC FUEL PRIMER

Steven R. Kuczenski, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 31, 1981, Ser. No. 297,994

Int. Cl.³ F02M *1/16*

U.S. Cl. 123—187.5 R **14 Claims**



1. A two piece self-mounting manually actuable primer for introducing a priming charge of fuel into an internal combustion engine intake system preparatory to starting the engine comprising:

a primer bulb or relatively flexible resilient material with an annular mounting ring at an extremity thereof; and

a base of relatively stiff resilient material having a slotted rim for sealingly receiving the annular mounting ring, a pair of self-fastening protuberances for passing into an apertured support to secure the base to the support and an apertured air passing protuberance with the protuberances all extending from a common base surface generally parallel to one another.

4,404,934

ROTARY VALVE IN AN INTERNAL COMBUSTION ENGINE

Urataro Asaka; Noboru Kurata, both of Kami-fukoka, and Masanori Masumura, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 49,068, Jun. 18, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 284,652

Claims priority, application Japan, Jun. 16, 1978, 53-82722; Jun. 26, 1978, 53-87815

Int. Cl.³ F01L *7/10*

U.S. Cl. 123—190 BD **4 Claims**

1. A rotary valve in an internal combustion engine, comprising:

a rotary valve proper arranged in a housing and having a substantially hollow cylindrical shape, said valve proper including a small diameter portion and an enlarged diameter portion;

said housing being provided in a cylinder head including a combustion chamber;

an inner space of said rotary valve proper being arranged to form a portion of an intake passage and a portion of an exhaust passage;

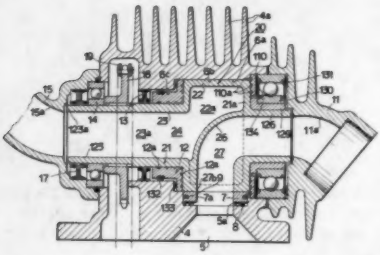
said portion of said intake passage in said valve proper including an expanded space arranged in said enlarged diameter portion of said valve proper and having a larger diameter than the diameter of the residual space in said portion of said intake passage;

said expanded space being disposed adjacent to said combustion chamber;

said portion of said intake passage and said portion of said exhaust passage being separated from each other and including end openings which selectively communicate with said combustion chamber as said valve proper rotates, said end openings being angularly shifted from each other on the same plane in the radial direction of said valve proper;

said portion of said intake passage and said portion of said exhaust passage including other end openings opened respectively at axial ends of said valve proper;

a substantially tubular wall having said portion of said exhaust passage confined therein, said tubular wall having a major proportion of the outer surface thereof exposed to and extending arcuately into the interior of said expanded space of said portion of said intake passage such that said portion of said exhaust passage is disposed substantially



within said expanded space of said portion of said intake passage;

a bush means provided with radial and axial extensions, said bush means being arranged on said valve proper at a stepped portion between said small diameter portion and said enlarged diameter portion;

said radial and axial extensions of said bush means being in slidable contact with an end surface of said enlarged diameter portion and an outer peripheral surface of said small diameter portion, respectively;

an O-ring provided at an outer peripheral portion of said axial extension of said bush means;

means for driving said rotary valve, said driving means being provided on said small diameter portion; and

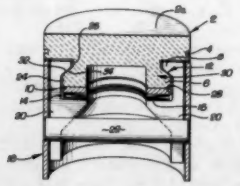
an oil seal means disposed between said driving means and said bush means.

4,404,935

CERAMIC CAPPED PISTON

Edwin H. Kraft, San Diego, Calif., assignor to Kyocera International, Inc., San Diego, Calif.

Filed Apr. 27, 1981, Ser. No. 257,666
Int. Cl.³ F01B *31/08*
U.S. Cl. 123—193 P **3 Claims**



1. A piston assembly comprising:

(a) a ceramic piston cap including:

a cylindrical cap section having upper and lower surfaces,

a downward facing extension attached to the lower surface of the cap section, and

an outwardly extending first radial flange attached to the extension and spaced from the lower surface of the cap section, said flange including a first contact surface which faces toward the cap section;

(b) a metallic body including:

a cylindrical body section having an upper surface with a central opening therein defined by a wall portion and a lower platform,

a second radial flange extending inwardly into said central opening from the wall portion, said second flange extending into the space between the first flange and the lower surface of the cap section and including a second contact surface which faces away from the cap section; and

(c) bias means for forcing the first contact surface against the second contact surface;

wherein the first and second flanges are configured so that contact between said flanges is limited to said first and second contact surfaces, whereby the assembly can accommodate differential thermal expansion of the piston cap and body while maintaining continuous contact therebetween;

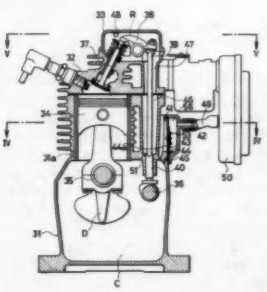
wherein said bias means is a spring located between said lower platform and said downward facing cap extension, wherein said spring forces said cap away from said body.

4,404,936

BREATHER DEVICE FOR OVERHEAD VALVE ENGINES

Yoshikazu Tatebe; Masafumi Egami, and Toshimitsu Miyawaki, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 16, 1981, Ser. No. 225,658
Claims priority, application Japan, Apr. 30, 1980, 55-58269[U]; May 6, 1980, 55-60697[U]
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 R **2 Claims**



1. A breather device for overhead valve engines, comprising a breather chamber, a crank chamber and a cylinder having a piston movable in said cylinder and a crank member connected to said piston disposed below said cylinder, a push rod chamber formed on one side of and integrally with said cylinder and said crank chamber, said cylinder having a cylinder head and defining a rocker chamber to one side of said cylinder, a push rod housed within said rocker chamber and said crank chamber, a blow by gas discharging passage formed around the periphery of said push rod and connecting said rocker chamber and said breather chamber, an air cleaner adjacent said breather chamber, a second breather chamber connected to said air cleaner, a one way breather valve allowing only the flow of gas from said breather chamber to said second breather chamber located between said breather chamber and said

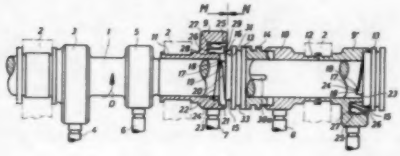
second breather chamber, said blow by gas discharging passage being opened at one end in the upper part of said rocker chamber and at its other end in said breathing chamber.

4,404,937

VALVE CONTROLLED STROKE PISTON COMBUSTION ENGINE WITH A CAM SHAFT

Wulf Leitermann, Bad Wimpfen, Fed. Rep. of Germany, assignor to Audi Nsu Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,676
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046402
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—198 F **11 Claims**



1. A valve controlled stroke piston combustion engine provided with a cam shaft which supports a number of cams equal in number to the inlet and outlet valves, the individual cylinders being switched off by stopping the associated inlet and outlet valves, the cams being associated with the valves, the cams being rotatably mounted and being axially non-displaceable on the cam shaft, dogs being mounted fixedly on said cam shaft cooperating with said cams, and each of said cams being provided with a front face with a concentric annular section groove with a continuously increasing depth with respect to the rotating axis of the cam shaft, said annular section groove ends having a radial abutment face, each dog being provided with an axial protrusion on a front face facing the corresponding cam, said protrusion engaging on the abutment face during a switched on valve and the pretensionable springs being provided for the engagement and disengagement of dogs.

4,404,938

FOUR-STROKE-CYCLE INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION

Zivomir Nikolic, U1.V1. Nazora 24, 51262 Kraljevica, Yugoslavia

Filed Nov. 17, 1981, Ser. No. 322,234
Int. Cl.³ F02B *3/00, 23/00*
U.S. Cl. 123—256 **2 Claims**

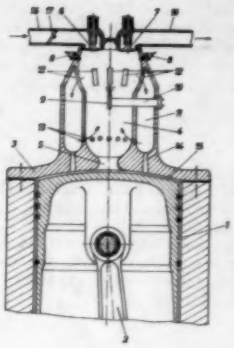
1. A four-stroke-cycle internal combustion engine comprising a piston housing, a cylinder head, a crankshaft, a piston which is connected to the crankshaft by a connecting rod and has a top face which almost contacts the cylinder head when the piston is at its top dead center, a combustion chamber disposed on top of said cylinder head, a passage extending from adjacent to the piston through the cylinder head and opening into said combustion chamber, inlet and outlet valves opening into the top portion of said combustion chamber,

fuel-injecting means, which are upwardly directed and protrude into said combustion chamber,

at least one spark plug means protruding into said combustion chamber,

a plurality of slots opening into the upper portion of said combustion chamber and permitting explosive gases to flow into a chamber which surrounds the combustion chamber,

a plurality of first openings which open into said surrounding chamber at its lower portion and are smaller in cross-section than the plurality of said slots and permit said explosive gases to flow back into said combustion chamber, and



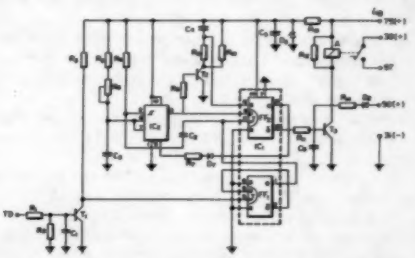
a plurality of downwardly flaring, conical second openings which open into said surrounding chamber in its lower portion and extend through said cylinder head toward said piston.

4,404,939

ELECTRICAL CIRCUIT FOR ACTUATION OF THE RELAYS OF A FUEL PUMP

Marwin Kinzl, Kierspe, and Eduard Bergmann, Luedenscheid, both of Fed. Rep. of Germany, assignors to Kostal of America, Ludenscheid, Fed. Rep. of Germany

Filed Aug. 10, 1981, Ser. No. 291,166
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030240
Int. Cl.³ F02D *33/00*
U.S. Cl. 123—333 **7 Claims**



1. An electrical circuit for controlling the operation of the relay of a fuel pump depending upon the number of revolutions of the motor supplied by the fuel pump, ignition pulses corresponding to the number of revolutions of the motor being coupled to said electrical circuit, said electrical circuit comprising: relay control means for energizing said relay, said relay being connected with an operating voltage and said relay control means comprising a transistor having its collector-emitter path connected in series with said relay, whereby said transistor upon being rendered conductive energizes said relay; timing means operated responsive to each of said ignition pulses for generating a timing signal having an interval corresponding to the minimally permissible time between two ignition pulses; and control means operated responsive to said ignition pulses and said timing signals for generating output signals to control said relay control means, said control means comprising a flip-flop having inputs to which said timing sig-

nals and said ignition pulses are coupled respectively and an output coupled to the base of said transistor, said control means being responsive when only a timing signal is coupled thereto to operate said relay control means to energize said relay to thereby operate said fuel pump, and being responsive to a timing signal and an ignition pulse being simultaneously coupled thereto to operate said relay control means to de-energize said relay to thereby cut off the operation of said fuel pump.

4,404,940

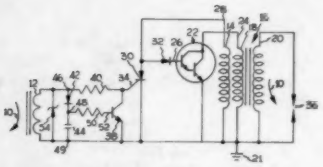
ENGINE SPEED LIMITING CIRCUIT

Norman F. Sieja, Toledo, Ohio, assignor to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 145,116, Apr. 30, 1980. This application Feb. 16, 1982, Ser. No. 349,394

Int. Cl.³ F02P *1/00*; F02A *1/00*

U.S. Cl. 123—335 **1 Claim**



1. A speed limiting circuit for an ignition system including an ignition coil including a primary coil winding and having a current control means for controlling the flow of a current through the primary coil winding to cause an ignition impulse in a secondary coil winding of said ignition coil, and trigger means operatively connected to the current control means for providing a trigger signal for controlling the current control means, comprising:

circuit means operatively interposed between said trigger means and said current control means;

said circuit means including threshold shorting means for at least intermittently shorting said trigger signal to prevent said trigger signal from being effective to actuate said current control device;

a resistor being operatively interposed between said trigger means and a first control terminal of said current control means;

said threshold shorting device having first and second controlled terminals operatively connected to said first control terminal of said current control means and to an electrical ground respectively for preventing said trigger signal from affecting said first control terminal;

said threshold shorting device having a second control terminal resistively connected to a first terminal of a diode means and a first terminal of a capacitor means, a second terminal of said diode means being electrically connected to said trigger means and a second terminal of said capacitor means being electrically connected to said electrical ground;

said trigger signal charging said capacitor means through said diode means, said capacitor means discharging through said second control terminal to render said threshold shorting device conductive for a first predetermined time period while a voltage of said capacitor means exceeds a threshold voltage of said threshold shorting device;

a trigger signal caused by said trigger means at a second predetermined time before a termination of said first predetermined time period being ineffective to actuate said current control means.

4,404,941

ELECTRONIC CONTROLLED CARBURETOR

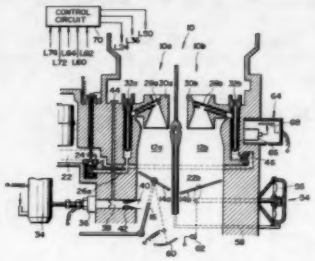
Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 9, 1981, Ser. No. 241,721

Claims priority, application Japan, Mar. 11, 1980, 55-30491

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—339 **9 Claims**



1. A carburetor for use in an internal combustion engine, comprising:

(a) an induction passage provided therein with venturi means and controlled by throttle valve means located downstream of said venturi means;

(b) a main fuel supply unit including a fuel bowl, a main nozzle opening to said venturi means, and a main fuel passage connecting said fuel bowl to said main nozzle;

(c) an auxiliary fuel supply means including a fuel pump, an auxiliary fuel passage terminating in a sonic nozzle opening into said induction passage downstream of said throttle valve means, a solenoid valve provided in said auxiliary fuel passage for controlling the rate of fuel flow through said auxiliary fuel passage, an air bleed opening into said auxiliary fuel passage downstream of said solenoid valve;

(d) a fast-idle mechanism for forcing said throttle valve means to open to a predetermined angle from its closed position when actuated; and

(e) a control circuit responsive to low engine temperatures for actuating said fast-idle mechanism and opening said solenoid valve to an opening degree coreresponding to said predetermined angle of opening of said throttle valve means, said control circuit being responsive to low load conditions for controlling the degree of opening of said solenoid valve in accordance with the rate of air flow through said induction passage, said control circuit being responsive to normal load conditions for closing said solenoid valve, said control circuit being responsive to high load conditions or a demand for acceleration for opening said solenoid valve to supply additional fuel so as to produce an overrich air-fuel mixture.

4,404,942

METHOD OF CONTROLLING THE ROTATIONAL SPEED OF A ROTARY SHAFT

Ken Asami, Nagoya, Japan, assignor to Toyota Jidosha K.K., Toyota, Japan

Filed Jul. 21, 1981, Ser. No. 285,591

Claims priority, application Japan, Jul. 26, 1980, 55/101866

Int. Cl.³ B60K *31/00*; F02D *11/10*

U.S. Cl. 123—352 **17 Claims**

1. A method of controlling the rotational speed of a rotary shaft, said method comprising the steps of:

generating speed pulses having a frequency proportional to an actual rotational speed V of said rotary shaft;

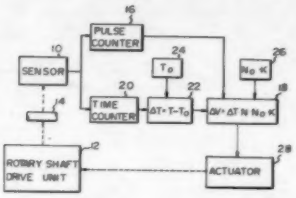
measuring a time T until a predetermined number of said speed pulses are generated;

calculating the difference ΔT between said measured time T

and a predetermined time T_o which is equal to the measured time T when said rotary shaft rotates at a desired rotational speed V_o;

measuring a number N of said speed pulses generated within a predetermined period of time;

multiplying said calculated difference ΔT, said measured number N and a predetermined number N_o which is equal to the measured number N when said rotary shaft rotates



at the desired rotational speed V_o, said multiplying being performed to obtain a value ΔV which is equivalent to the difference between the actual rotational speed V and said desired rotational speed V_o; and

controlling, in response to said value ΔV the rotational speed of said rotary shaft to reduce the difference between the actual rotational speed V and said desired rotational speed V_o to zero.

4,404,943

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

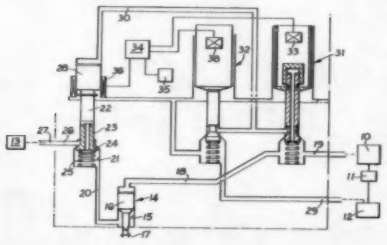
Alec H. Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 30, 1981, Ser. No. 325,775

Claims priority, application United Kingdom, Jan. 27, 1981, 8102388

Int. Cl.³ F02D 5/02

U.S. Cl. 123—447 **5 Claims**



1. A fuel for supplying fuel to an internal combustion engine, comprising an accumulator in which fuel is stored at a high pressure, an injection nozzle which receives fuel from the accumulator, electrically operated means for opening a valve in the injector nozzle, thereby to allow delivery of fuel to the engine, a pump for supplying fuel to the accumulator, characterized in that the accumulator has a small volume, and by a transducer for providing an electrical signal indicative of the pressure within the accumulator, electrically operated valve means for controlling the output of said pump, a control circuit for said valve means, said electrical signal forming a first input signal to said control circuit, circuit means for providing a second input signal to said control circuit, said second input signal varying in accordance with an operating parameter of the associated engine, said control circuit acting to control said valve means so that the pressure in said accumulator varies in accordance with said second input signal, and said pump comprising a high pressure pump and a low pressure pump, said valve means acting to control the flow of fuel from said low pressure pump to said high pressure pump.

4,404,944

FUEL SUPPLY SYSTEM FOR AN INJECTION-TYPE INTERNAL COMBUSTION ENGINE

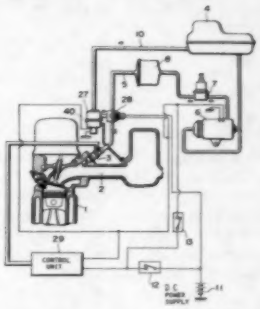
Masafumi Yamazaki, Yokohama, and Mikio Suzuki, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 290,078

Claims priority, application Japan, Aug. 7, 1980, 55-111163[U]; Aug. 15, 1980, 55-115662[U]; Sep. 10, 1980, 55-124700

Int. Cl.³ F02D 5/02; F02M 51/00

U.S. Cl. 123—458 **13 Claims**



1. A fuel supply system for an internal combustion engine using a gasoline or alcohol blended gasoline as a fuel, comprising:

(a) a fuel tank;

(b) a fuel injector which injects the fuel to the engine;

(c) a fuel supply line which connects said fuel injector with said fuel tank;

(d) a fuel pump disposed in said fuel supply line;

(e) a fuel return line connected with said fuel supply line beteen said fuel pump and fuel injector, for returning an amount of fuel to upstream of said fuel pump;

(f) a fuel pressure regulator disposed between said fuel supply line and fuel return line for regulating the amount of returned fuel and a fuel pressure in said fuel supply line between said fuel pump and fuel injector;

(g) temperature sensor means for generating a signal when the temperature of the fuel in said fuel supply line is above a predetermined value; and

(h) means for restricting the amount of returned fuel and for raising the fuel pressure in response to the signal outputted from said temperature sensor means.

4,404,945

FUEL-SUPPLY CONTROL SYSTEM FOR GAS-TURBINE ENGINE

Yasuo Fujikawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 290,076

Claims priority, application Japan, Oct. 21, 1980, 55-146238

Int. Cl.³ F02B 3/00

U.S. Cl. 123—478 **10 Claims**

1. A fuel-supply control system for a gas-turbine engine, comprising:

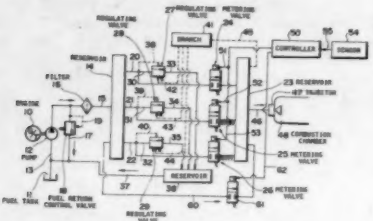
(a) a fuel injector opening to an engine combustion chamber;

(b) a reservoir connected to the fuel injector;

(c) at least two different lines each connected at one end to the reservoir, the lines being permitted to pass fuel there-

through to supply the fuel to the combustion chamber through the reservoir and the fuel injector;

(d) metering valves whose number is equal to the number of the lines and which are arranged in the lines respectively in such a manner that the lengths of the lines from the corresponding metering valve to the reservoir are different from each other, the metering valves being changed from one of open and closed states to the other when energized;



(e) a sensor detecting an engine operating condition; and

(f) a controller electrically connected to the sensor for receiving the output signal from the sensor indicative of the engine operating condition, the controller producing a pulse train whose duty cycle responds to the engine operating condition and feeding the pulse train to the metering valves to open them periodically.

4,404,946

METHOD FOR IMPROVING FUEL CONTROL IN AN INTERNAL COMBUSTION ENGINE

John W. Hoard, Livonia, and Richard R. Tuttle, Utica, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 79,293, Sep. 27, 1979, abandoned. This application Nov. 2, 1981, Ser. No. 317,671

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—486 **5 Claims**

1. A method for improving the fuel control of an internal combustion engine having an intake conduit and an exhaust conduit, the method comprising the steps of:

(a) measuring the intake conduit pressure value;

(b) establishing an exhaust conduit pressure value;

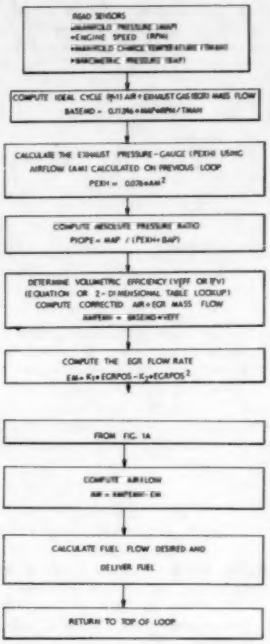
(c) determining the ratio between the engine's intake conduit pressure value and its exhaust conduit pressure value;

(d) using the determined ratio to determine the volumetric efficiency value of the engine, the volumetric efficiency value being determined with respect to the flow of gases into at least one combustion chamber of the engine;

(e) calculating the air mass flow into the engine based upon such determined volumetric efficiency value;

(f) metering fuel to the engine in a quantity based upon such calculated air mass flow; and

when a value for air mass flow is available said steps of establishing an exhaust conduit pressure value including



calculating the exhaust conduit pressure using the latest available air mass flow.

4,404,947

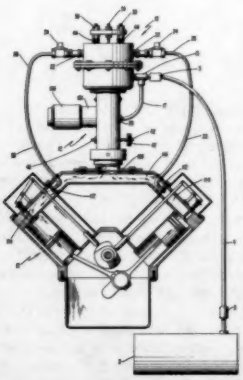
VAPOR/AIR CONTROL SYSTEM

Wayne A. Swanson, Knights Hill Rd., New London, N.H. 03257

Filed Mar. 10, 1981, Ser. No. 241,838

Int. Cl.³ F02M *21/04;* **F02B** *43/00*

U.S. Cl. 123—527 **16 Claims**



1. A device for controlling the flow of a gaseous fuel to an

internal combustion engine, said engine having a plurality of cylinders, and operable in conjunction with apparatus to control the flow of air to said cylinders comprising:

(a) a reservoir having an inlet for receiving gaseous fuel under pressure;

(b) a plurality of chambers equal in number to the number of said cylinders, each of said chambers being in individual fluid communication with said reservoir;

(c) means for separately connecting each of said chambers to a respective one of said cylinders;

(d) individual valve means biased to a closed position for controlling the fluid communication between said chambers and said reservoir;

(e) means connected with the throttle of said engine for simultaneously opening said valve means against said bias in response to actuation of said throttle; and

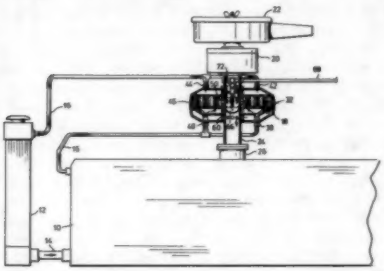
(f) means connectable with said air control apparatus for regulating the flow of air to said engine.

4,404,948

FUEL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Galiano Feltrin, R. R. #1, Stoney Point, Ontario, Canada

Filed Oct. 6, 1980, Ser. No. 194,109
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—546 **6 Claims**



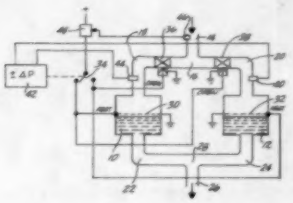
1. A fuel system for an internal combustion engine comprising mixing means for forming a mixture of fuel and air, conduit means for directly delivering mixed fuel and air from a mixing means to a combustion site of said engine, a heat exchanger disposed about said conduit means, means for delivering a heating medium to said heat exchanger, said medium being heated by engine operation and means operatively associated with said conduit means causing the said mixed fuel and air to be diverted from said conduit means and to pass through said heat exchanger, said means operatively associated with said conduit means comprising inlet port means opening from said conduit to said heat exchanger, return port means disposed down stream of said inlet port means and opening from said heat exchanger to said conduit means and valve means disposed in said conduit means between said inlet and return port means, said valve means being movable between closed position in which fuel air mixture is caused to pass through said heat exchanger and an open position in which fuel air mixture is passed directly to said combustion site, said heat exchanger comprising an inlet header for heating medium, a return header for that medium, and a plurality of heat exchanging tubes extending between said headers and within a heat exchange chamber, said headers and said chamber being of annular form and wherein said conduit means for delivering mixed fuel and air from a mixing means to the combustion site includes a conduit section extending axially through said headers and said chamber.

4,404,949

HEATED DIESEL FUEL FILTER

Lon E. Bell, Altadena, Calif., assignor to Technar Incorporated, Arcadia, Calif.

Filed Dec. 11, 1980, Ser. No. 215,537
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **3 Claims**



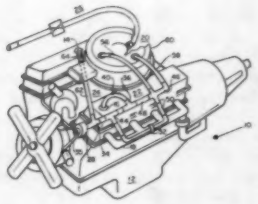
1. A heated filter for diesel fuel or a similar type fuel comprising: a source of fuel, a housing forming a fully enclosed chamber, a non-metallic filter element in the chamber dividing the chamber into an inlet region and an outlet region on opposite sides of the filter element, a fuel inlet to the inlet region of the chamber, a fuel outlet to the outlet region of the chamber, and heater means in the inlet region adjacent the filter element, the heater means including an electrical resistance heating element, the resistance heating element comprising a metal grid having openings through which the fuel passes before passing through the filter element, the metal grid being positioned in the path of fuel passing from the inlet to the filter element for heating all fuel passing through the filter, the metal grid being positioned immediately adjacent the filter element so that the fuel flow through the grid at any position is limited by the flow of fuel through the filter at the same position.

4,404,950

AUTOMOTIVE FUEL SAVING SYSTEM

Alfred C. Dallman, 2437 Bending Willow Dr., Kettering, Ohio 45440

Filed Feb. 9, 1982, Ser. No. 347,382
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—572 **3 Claims**



1. In a crankcase ventilating and vapor utilizing sytem for an internal combustion engine having a sealed crankcase and an air-fuel intake system, said system having a first air flow circuit for withdrawing crankcase vapors from said engine crankcase and directing the same into said engine intake system, a second air flow circuit for providing a flow of air into said engine crankcase, and a third air flow circuit for metering air into said engine intake system to provide compensation for the addition of said crankcase vapors into said intake system, the improvement in said crankcase ventilating and vapor utilizing system comprising:

air pumping means connected to both said first and second circuits for feeding air to said first and second circuits

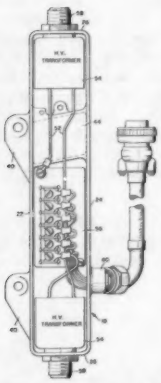
such that air and crankcase vapors will be withdrawn from said crankcase to said first circuit and directed to said engine intake system, as air is added to said crankcase from said second circuit, whereby a continuous circulation of air through said crankcase and ventilation of vapors therefrom is achieved, accompanied by combustion of said vapors in said engine after introduction through its intake system.

4,404,951

IGNITION CONTROL BOX ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Richard Zechlin, Beloit, and Robert M. Henderson, Williams Bay, both of Wis., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,845
Int. Cl.³ F02P 1/00
U.S. Cl. 123—595 7 Claims



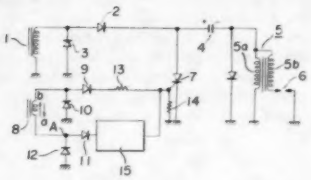
1. An ignition control box assembly adapted to be retrofit onto an internal combustion engine and to maintain a hose for such engine against movement in all directions and within the confines of the engine profile comprising a unitary metal housing including spaced top and bottom walls, spaced endwalls extending between and integral with said top and bottom walls, a backwall integral with and extending between said top, bottom and endwalls on a back side of said housing to form an enclosure, the front side of said housing opposite said back side being open, and chamber means for retaining said hose against movement in all directions and isolating the hose from contact with said engine while providing magnetic isolation for electronic components within said enclosure, said chamber means including chamber wall means formed integrally with said top, bottom and backwalls and extending inwardly of said enclosure from said backwall toward the front side of said housing to define an open ended chamber extending between said top and bottom walls and having no opening into said enclosure, said top and bottom walls each including an opening within the confines of said chamber wall means to provide the open ends of said chamber, said chamber wall means being spaced from each of said endwalls to divide said enclosure into first and second compartments separated by said chamber, and a closure assembly means for closing the front side of said housing.

4,404,952

MAGNET IGNITION DEVICE

Takanori Fujimoto, and Yasuo Tada, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 95,521, Nov. 19, 1979. This application Dec. 18, 1981, Ser. No. 332,206
Claims priority, application Japan, Dec. 19, 1978, 53-157268
Int. Cl.³ F02P 5/08
U.S. Cl. 123—602 2 Claims



1. A magnet ignition device comprising: power source means for producing a positive and negative output in synchronism with the rotation of an engine and capable of making the output rectified pass through an ignition coil; a switching element for controlling the passage of current to the ignition coil; an angular position detecting means for producing a first angular signal with one polarity corresponding to an angular position of a given crankshaft of the engine and a second angular signal with the other polarity corresponding to an angular position of the crankshaft retarded by a given angle relative to the angular position where the first angular signal is produced, in synchronism with the rotation of the engine; and an ignition timing operation circuit which produces an operational signal in response to the first angular signal and comprises an integration circuit which defers the timing of production of an operational signal fed to the switching element in accordance with the speed of the engine, wherein the second angular signal and the operational signal are each applied to the switching element such that for each engine revolution the firstly produced of said second angular signal and said operational signal produces switching of said switching element to produce passage of current to the ignition coil, such that when the rotational frequency is higher than a given rotational frequency of the engine, the operational signal is used to initiate ignition as a function of engine speed while, when it is lower than the given rotational frequency, the second angular signal is used to initiate at a predetermined angle of engine rotation.

4,404,953

STOVE FOR BURNING COMBUSTIBLE SOLID FUELS

Robert D. Thulman, 10309 Wilde Lake Ter., Columbia, Md. 21044, and Alve J. Erickson, 17 Pleasant St., Milford, N.H. 03055

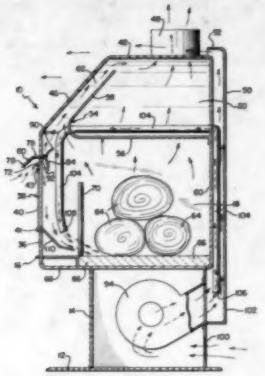
Filed May 4, 1981, Ser. No. 260,092
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 40 Claims

1. A stove for burning combustible solid fuels comprising:
an enclosed firebox;
baffle means for dividing said firebox into a lower combustion chamber and an upper chamber and for permitting gases from said combustion chamber to flow into said upper chamber;
means for facilitating introduction of combustible solid fuel into said combustion chamber;
outlet means communicating with said upper chamber for withdrawing combustion gases from said firebox;
air inlet means through a wall of said firebox for admitting a flow of air into the firebox;
means for splitting a flow of air admitted into said firebox through said air inlet means into first and second portions

and for directing said first portion of air toward the bottom of said combustion chamber and said second portion of air toward said upper chamber;

said baffle comprising a generally horizontal portion extending from the back wall of the firebox to a point spaced from the front wall of the firebox and an upwardly projecting portion extending from said horizontal portion generally parallel to said front wall to a point spaced from the top of said firebox; and

said upwardly projecting portion and said front wall defining a passageway through which gases may pass from said combustion chamber to said upper chamber.



4,404,954

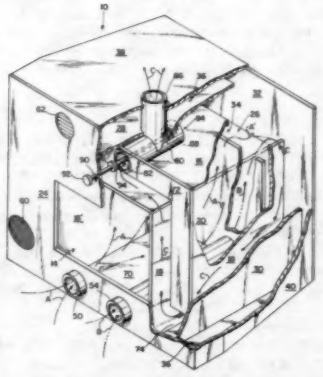
FIREPLACE FURNACE

James S. Steel, 841 Bowie Rd., Rockville, Md. 20852

Filed Jan. 27, 1981, Ser. No. 228,717

Int. Cl.³ F24J 3/02

U.S. Cl. 126—121 **26 Claims**



1. A furnace for the hot air heating of a room comprising:

an enclosed primary combustion chamber for burning a fuel, the burned fuel producing a flue gas containing volatiles;

an enclosed room air heating chamber for heating the room air; and

an enclosed secondary combustion chamber for burning the volatiles remaining in the flue gas from said primary combustion chamber, said secondary combustion chamber substantially surrounds the primary combustion chamber;

means for supplying combustion air to said secondary combustion chamber, said secondary combustion chamber being disposed between said primary combustion chamber and said room air heating chamber such that the heat transferred to said room air heating chamber is not transferred directly from said primary combustion chamber.

18. A method for the hot air heating of a room comprising the steps of:

burning a fuel in an enclosed primary combustion chamber;

directing the flue gas containing volatiles from the burning of the fuel in the primary combustion chamber to an enclosed secondary combustion chamber that substantially surrounds the primary combustion chamber;

burning the volatiles in the flue gas in the secondary combustion chamber;

directing the flue gas from the burning of the volatiles in the secondary combustion chamber in a path around a portion of the primary combustion chamber; and

heating room air in a room air heating chamber disposed around the path of the flue gas in the secondary combustion chamber by conductive heat transfer from the secondary combustion chamber so that heat transfer occurs only after secondary combustion and so that no direct conductive heat transfer occurs from the primary combustion chamber.

4,404,955

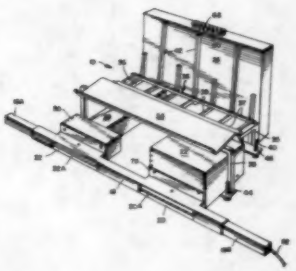
FIREPLACE HEAT EXTRACTOR

William P. Sherman, Portland; Floyd R. Clark, Scappoose, both of Oreg., and Lothar K. Will, Sparta, Tenn., assignors to Thomas Industries Inc., Louisville, Ky.

Filed Aug. 20, 1981, Ser. No. 294,614

Int. Cl.³ F24B 7/00

U.S. Cl. 126—121 **20 Claims**



14. A forced-air heat extraction system for use in a conventional fireplace, said system comprising:

a bottom bar positioned at the lower forward portion of said fireplace, said bottom bar having an air inlet and an air outlet in air flow communication with a room to be heated;

a plenum located in the rear of said fireplace beneath a stack;

inlet duct means communicating said air inlet with said plenum;

outlet duct means communicating said air outlet with said plenum;

housing means in one of said ducts;

electrically energized air circulating means located in said housing means, said housing means coupling said air inlet to said inlet duct for forcing room air through said inlet, said air inlet duct means, said plenum, said outlet duct means and back into said room through said air outlet; and

temperature responsive means positioned adjacent the upper portion of said plenum for venting hot air in said plenum into said stack when the temperature of the air therein exceeds a predetermined value.

4,404,956

FURNACE WITH DRAFT-LIMITER AND VENTILATION

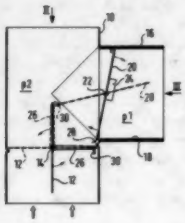
Luitpold Kutzner, Bosettistrasse 8, D-8000 Munich 60, Fed. Rep. of Germany, and Erwin Postenrieder, Mehring, Fed. Rep. of Germany, assignors to Luitpold Kutzner, Munich, Fed. Rep. of Germany

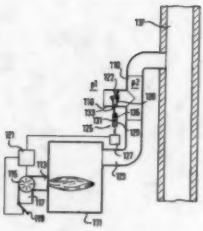
Filed Apr. 14, 1981, Ser. No. 254,087

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1980, 3015472

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—293 27 Claims





1. Furnace wherein there is connected to the exhaust gas duct after said furnace in the flow direction a ventilation opening with a ventilation flap openable in chronological conjunction with the cut-off of said furnace and closable in chronological conjunction with the switching-on of said furnace, and wherein there is further connected to said exhaust gas duct after said furnace in the flow direction a draft-limiter opening with a draft-limiter flap, whereat said draft-limiter flap is prestressed in the direction of a closing position and is to be opened by the pressure difference incident upon it, p1-p2 (flue draft) between the pressure p2 in said exhaust gas duct and the possibly higher pressure p1 on its outer side, in such a way that when the pressure difference exceeds a predetermined value said draft-limiter flap increasingly opens for the purpose of maintaining a predetermined pressure difference, characterized in that said ventilation opening is formed by said draft-limiter opening (16) and said ventilation flap is formed by said draft-limiter flap (20), whereat said draft-limiter flap (20), during an operating pause of said furnace, is held in an open position independently of said pressure difference (p1-p2) prevailing at said draft-limiter flap (20).

4,404,957

EQUIPMENT AND PROCESS FOR HEATING WATER BY SOLAR ENERGY

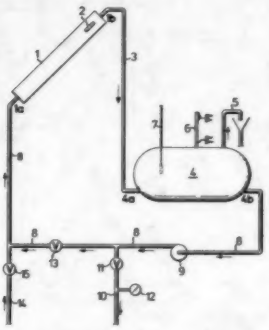
Armin Bayerle; Karl-Heinz Holz; Johannes Lüke, all of Frankfurt am Main, and Wolfgang Riederer, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,594

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948207

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—419 5 Claims



1. Solar heating apparatus comprising a solar collector having an inlet and an outlet for a liquid; a reservoir having an inlet and an outlet for said liquid; conduit means for circulating the liquid from the collector outlet to the reservoir inlet and from the reservoir outlet to the collector inlet; withdrawal means between the reservoir outlet and collector inlet for withdrawing liquid from the apparatus on demand; injection means independent of said withdrawal means for injecting fresh liquid into the collector; means for sensing a temperature differential between the liquid in the collector and the liquid in the reservoir; and means responsive to the temperature differential sensing means for circulating liquid from the collector to the reservoir and recycling liquid from the reservoir to the collector or injecting fresh liquid into the collector.

4,404,958

SOLAR ENERGY COLLECTOR, AND WATER HEATER AND HEATING DEVICE WITH A HEAT PUMP CONTAINING THE SAID COLLECTOR

Alfred Boettcher, Hangstrasse 11, 51 Aachen, Allemagne, Fed. Rep. of Germany, assignor to Alfred Boettcher, Aachen, Fed. Rep. of Germany

Filed Jul. 14, 1980, Ser. No. 168,672

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929162; Nov. 28, 1979, 2947877; Feb. 13, 1980, 3005253

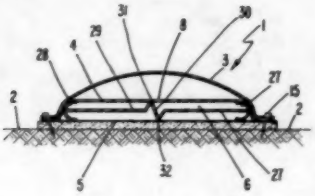
Int. Cl.³ F24J *3/02*

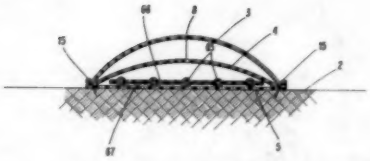
U.S. Cl. 126—426 15 Claims

1. A water heater, comprising a heat exchanger having a first compartment through which water to be heated is passed, and a second compartment through which a hot gaseous fluid is passed; means defining a circuit for the circulation of the fluid through said second compartment; and, in said circuit upstream of the said heat exchanger, a solar energy collector comprising at least three plastic sheets joined together so as to delimit a tube having inlet and outlet means for the circulation of the gaseous heat transfer fluid, and an insulation chamber on said tube, and wherein at least that sheet which constitutes an external wall of said chamber is permeable to solar radiation and further comprising means for absorbing solar energy arranged to contact the gaseous fluid circulated through said tube, means limiting the mean height of said tube, means com-

municating said insulation chamber with said tube for the circulation of gaseous fluid therebetween and means for fixing said collector to a support surface.

3. In a solar energy collector for heating a gaseous fluid, said collector comprising at least three plastic sheets joined together so as to delimit a tube and an insulation chamber adjacent said tube, said insulation chamber defined by a sheet which constitutes an external wall thereof and one of said sheets of said tube, wherein at least said sheet which constitutes an external wall of said chamber is permeable to solar radiation and wherein said tube includes inlet and outlet means for the circulation of a gaseous heat transfer fluid, the improvement comprising:





means for absorbing solar energy arranged to contact the gaseous fluid circulated through said tube which also serves as means limiting the mean height of said tube, said means comprising a thin plate which includes means defining a longitudinal bend, the profile of which is approximately N-shaped;

means communicating said insulation chamber with said tube for the circulation of gaseous fluid therebetween, said means comprising at least one opening in said one of said sheets of said tube; and

means for fixing the said collector to a support surface.

4,404,959

SOLAR HEATING SYSTEM

Ralph Mondragon, P.O. Box 199, Ranches of Taos, N. Mex. 87557

Filed Feb. 2, 1982, Ser. No. 345,167
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **10 Claims**

1. A solar heating system comprising:

a. a heat collecting and storage chamber located at the upper level of a building;

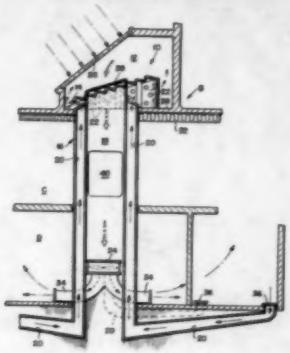
b. solar heat collecting means disposed and extending laterally within said chamber;

c. a hot air supply and return plenum including a generally vertically extending central air supply duct and a plurality of generally vertically extending return air passages surrounding said supply ducts;

d. heat storage and yielding means disposed in said chamber and adjacent said hot air supply and return plenum; and

e. means effecting circulation of air through said system by drawing hot air from said chamber through said supply duct and by returning relatively cooler air to said chamber through said return air passages;

wherein said heat collecting and storage chamber includes windows and a floor enclosing said chamber; said windows are disposed above said heat collecting means to enable impingement of the sun's rays upon said heat collecting means; said floor supports said heat storage and yielding means within said chamber; and said hot air



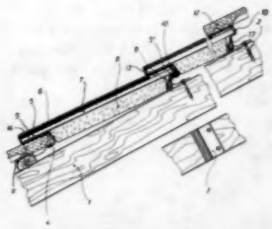
supply plenum, including said supply duct and said return air passages, extends down through said floor of said chamber to lower levels of a building in which said solar heating system may be installed.

4,404,960

ROOF SKIN FORMING A HEAT SINK

Karsten Laing, Herrenstrasse 57, 7500 Karlsruhe, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 140,995
Claims priority, application Austria, Apr. 17, 1979, 2864/79
Int. Cl.³ F24J 3/02
U.S. Cl. 126—432 **11 Claims**

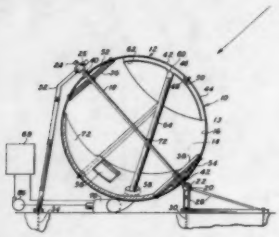


1. An absorber element for the absorption of solar energy and for exchanging heat with ambient air, characterized in that said element has a radiation absorption metal plate with an outer facing surface adapted to act as a roof skin and to be exposed to ambient air where the outer facing surface is substantially identical in appearance with that of a conventional roof covered with a plurality of conventional shingles, in that said element has a plastic extrusion panel with a plurality of fluid channels therein adapted to contain a heat carrier fluid and where the extrusion panel is engaged with said metal plate to provide direct thermal communication with an inner facing surface of the metal plate opposite said outer facing surface, in that the length of one margin of said element corresponds to the width of a plurality of conventional shingles, and in that said element has an overlapping region along two margins thereof adapted to join with conventional shingles.

4,404,961
APPARATUS FOR COLLECTING SOLAR ENERGY

Frank A. Stuhlman, Rte. 5, Weller Dr., Plainfield, Ill. 60544

Filed Nov. 17, 1980, Ser. No. 207,558
Int. Cl.³ F24J 3/02
U.S. Cl. 126—432 8 Claims

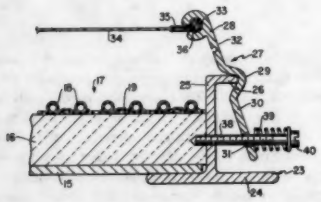


1. An apparatus for collecting solar energy comprising:
a first rigid hemispherical member;
a second rigid hemispherical member; said two members each having an opening at the apex and a circumferential flange at the periphery with an exterior surface having a solar heat absorbing coating thereon and being sized identically such that the two members may be joined as a sphere and restraining means associated with said flanges holding said members in fixed assembled relationship;
an axle member insertable through said apex openings to extend beyond said assembled sphere on at least one end; said axle member connected to said sphere assembly by internal support members such that said sphere assembly is mounted on and carried by said axle member;
at least one support frame to engage said extending end of said axle to support said axle and said carried sphere assembly; and
means for directing a heat transferring gas into the interior of said sphere assembly to pick up heat energy from said sphere and means for extracting said gas after it has been heated.

4,404,962
LARGE FORMAT FILM GLAZED SOLAR COLLECTOR

Michael Zinn, Ellenville; Tamil D. Bauch, Kingston, and Morton Schiff, Kerhonkson, all of N.Y., assignors to Raybend Associates, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,709
Int. Cl.³ F24J 3/02; E04H 14/00; A45C 13/00; B65D 45/16
U.S. Cl. 126—450 21 Claims

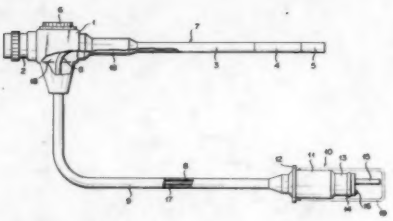


9. A solar collector assembly comprising
(a) a rectangular planar base,
(b) a frame around the periphery of said base,
(c) a flexible glazing film spanning said frame and covering said base,
(d) said frame including two pivotable elongated members along opposed longer sides of the rectangular base and having opposed upper edge portions movable away from one another,
(e) adjustable securing means connecting the pivotable frame members to the base, and
(f) said glazing film being secured along opposite edges to the movable edge portions of the pivotable frame members,
(g) whereby said pivotable frame member is pivoted by said securing means so that its edge portion moves away from the opposite portion of the frame to tension the glazing film.

4,404,963
ENDOSCOPE

Kitijiro Kohri, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1980, Ser. No. 199,866
Claims priority, application Japan, Oct. 31, 1979, 54-140647
Int. Cl.³ A61B 1/00
U.S. Cl. 128—4 15 Claims



1. In combination:
an endoscope having at least one end;
means defining a closed internal air filled space extending through substantially the entire length of the endoscope;
a cylindrical end portion connected to said one end and having an outer peripheral wall and an air port communicating said internal space to ambient air;
a hollow cylindrical fluid tight cap member of substantially the same length as said end portion and sized to slide telescopically over said end portion from the outer to the inner end thereof while covering said port;
means forming a sliding gas tight seal between the inner surface of said cap adjacent the open end thereof and said outer peripheral wall so that movement of said cap from the outer to the inner end of said portion is effective to force air in said cap inwardly through said port to pressurize said closed internal air filled space; and
latching means for retaining said cap in fully telescoped position on said end member to maintain pressurization of said endoscope.

4,404,964
ENDOSCOPE OCULAR DEVICE

Koji Kambara, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

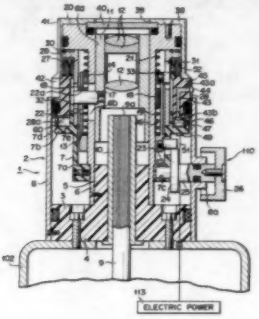
Filed Nov. 7, 1980, Ser. No. 204,897
Claims priority, application Japan, Nov. 15, 1979, 54-148209
Int. Cl.³ A61B 1/00
U.S. Cl. 128—4 5 Claims

1. An endoscope ocular device which comprises:
a hollow cylindrical housing having two ends and which is concentrically penetrated by an image guide from one of said ends to an intermediate part of the housing;
an ocular mounted in the housing in a state facing said image guide and being movable axially of the housing;
rotatable diopter-adjusting means concentrically provided in the housing in a state movable axially of the housing and being operatively connected to the ocular;

a return ring operatively connected to the diopter-adjusting means, and which has an outer peripheral wall, the return ring being provided in the housing in a rotatable but axially immovable state such that the return ring, when taking a first angular position relative to the housing, causes the diopter-adjusting means to set the ocular in a prescribed dioptric positon, and, when taking a second angular position, causes the diopter-adjusting means to return to a position enabling axial movement;

a contact chamber disposed between the return ring and housing and extending circumferentially of the housing;

a source of electric power coupled to the housing;



a first electrical contact provided in the return ring and having two ends, one end of said first electrical contact being exposed to the outer periphery of the return ring, and the other end of said first contact projecting into the contact chamber; and

a second electrical contact coupled to the electric power source and which is mounted in the contact chamber such that when the return ring is in the first angular position, the second electrical contact contacts the other end of the first electrical contact, and, when the return ring is in the second angular position, the second electrical contact is removed from the first electrical contact.

4,404,965

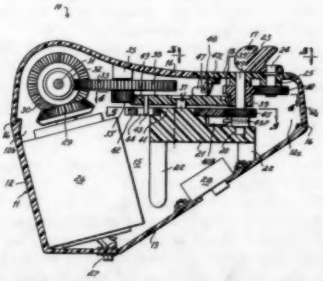
SKIN MASSAGE DEVICE

Kym H. Waits, and Roland S. Sedziol, both of Cincinnati, Ohio, assignors to Kym H. Waits, Cincinnati, Ohio

Filed Jan. 27, 1982, Ser. No. 343,270

Int. Cl.³ A61H 7/00

U.S. Cl. 128—46 **13 Claims**



1. A massage device comprising: a housing, an electric motor mounted by and within said housing; a massage element mounted for movement relative to said housing; and drive means connecting said motor to said massage element for generating a cyclical path of motion of said massage element comprising a circular motion followed by an increasing, then decreasing spiral path.

4,404,966

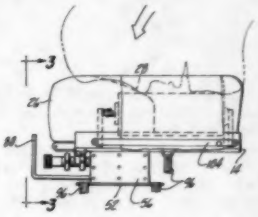
HEADREST FOR A CHIROPRACTIC DEVICE

Lawrence Hartman, 2015 Rowland, Royal Oak, Mich. 48067

Filed Jul. 24, 1981, Ser. No. 286,574

Int. Cl.³ A61F 5/00

U.S. Cl. 128—69 **5 Claims**



1. A portable headrest for use with a chiropractic table of the type having a pair of stationary headrests spaced apart from each other and forming a space therebetween, said portable headrest comprising:

a base plate having an upper end and a lower surface,

means for securing said base plate to said stationary headrests,

a support plate,

means pivotally securing one edge of said support plate to one edge of said base plate so that said support plate is pivotal between a first position in which said support plate is spaced outwardly from said upper surface of said base plate, and a second position in which said support plate is positioned closely adjacent said base plate,

a channel member secured to a midpoint of said base plate, said channel member extending outwardly from said lower surface of said base plate and said channel member being dimensioned to fit in said space between said stationary headrests,

latch means for retaining said support plate in said first position, said latch means being at least partly contained within said channel member and releasable upon application of a predetermined pressure on said support plate in a direction towards said base plate,

means for moving said support plate from said second position and to said first position, said moving means comprising an elongated handle extending outwardly from one end of said channel member so that said handle extends through said space between said stationary headrests, said handle having a free end extending outwardly from said one edge of said base plate, and

means for variably adjusting the release pressure of said latch means, said adjusting means comprising an adjustment member extending outwardly from said one end of said channel member extends through said space between said stationary headrests, said adjustment member having a free end positioned adjacent said one edge of said base plate.

4,404,967
SURGICAL STRUT FOR TREATMENT OF THE BACK-BONE

Kazimierz Bacal, Akademicka; Lech Wierusz, Browarniany, and Stanislaw Kossek, Maja, all of Poland, assignors to Wyzsza Szkola Inzynierska Im. Jurija Gagarina, Zielona

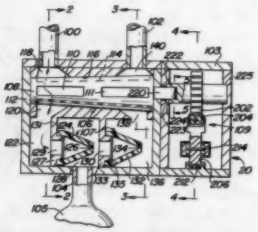
Filed Jan. 10, 1983, Ser. No. 456,734
Claims priority, application Poland, Jan. 18, 1982, 234744
Int. Cl.³ A61F 5/01
U.S. Cl. 128—69 1 Claim

1. A surgical strut for the treatment of the back-bone consisting of a rod having a circular cross-section and a pectoral- and lumbar hook mounted thereon, characterized in that it has a rod (1) provided with a thrust pin (2) protruding at one side and mounted on one end of the rod longitudinally cut sleeve (3) with skew recesses (4) made along the cut, whereby the end of the sleeve (3) external in relation to the rod (1) has the outer surface in a form of a cone on which a pectoral hook (5) is mounted with the conical inner surface of the hole.

4,404,968
PUMP AND VALVE ASSEMBLY FOR PENILE IMPLANT

Alvin S. Evans, Sr., 234 Shubert Ave., Runnemede, N.J. 08078

Filed Apr. 7, 1982, Ser. No. 366,447
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 20 Claims

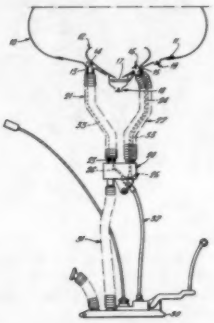


1. For simulating a natural erection, a pump and valve assembly to be used in combination with a prosthetic penile implant which includes bladder means which are implanted within the penis and a fluid containing reservoir which is implanted at a remote location thereto, wherein said assembly comprises a housing, a first portion of which is in fluid communication with said reservoir and a second portion of which is in fluid communication with said bladder means, valve means coupled between said reservoir and said bladder means for controlling the flow of fluid therebetween, moveable means which when in a first position allows said fluid to flow from said reservoir, through said valve means into said bladder means and when in a second position allows said fluid to flow from said bladder means, through said valve means and into said reservoir, means for moving said moveable means between said first and second positions, pump means coupled to said valve means for pumping said fluid from said reservoir to said bladder means to produce a simulated erection when said moveable means is in said first position and from said bladder means to said reservoir to produce a flaccid penis when said moveable means is in said second position.

4,404,969
RESPIRATORS

Arnold W. Cresswell, 132, Prospect Rd., Farnborough, Hampshire; John Ernsting, 21, Wellington Ave., Fleet, Hampshire; James A. Turnbull, "Coppice", Ash Green Rd., Ash, Aldershot, Hampshire, and Waldemar E. Voss, "Blandings", Potter Street Hill, Pinner, Middlesex, all of England

Filed Nov. 9, 1978, Ser. No. 959,100
Claims priority, application United Kingdom, Nov. 11, 1977, 47129/77
Int. Cl.³ A61M 15/00; A62B 18/00
U.S. Cl. 128—201.23 23 Claims



1. Apparatus for supplying respirable gas to a respirator of the type having a hook with a cowl and a visor adapted to envelop at least the face of a user and a mask for delivering respirable gas to the user, means for maintaining a gas pressure within the hood but outside the mask greater than that outside the hood and for preventing misting of at least a portion of the visor, said apparatus comprising:

a control unit including an air supply manifold and mountable on the person and mounted remote from the respirator,

a respirable air supply duct connected into said air supply manifold,

a flexible mask supply duct connected to said air supply manifold and adapted for connection to the respirator mask,

a flexible hood supply duct connected to said air supply manifold and adapted for connection to the respirator hood cavity external to the mask,

a non-return valve in said hood supply duct and permitting therein in use only flow of gas from said air supply manifold to the hood,

a flexible mask oxygen supply duct having an exit within said mask supply duct and adapted for connection to a constant flow source of oxygen, and

a restriction in said mask oxygen supply duct for controlling the flow of oxygen therethrough,

the total capacity of said mask supply duct and said air supply manifold being such that sufficient oxygen can be stored therein between inspirations to ensure on inspiration a predetermined minimum thereof within a range of partial pressures of oxygen in the respirable gas and surplus oxygen can enter said hood supply duct during prolonged non-inspiration.

23. Apparatus for supplying respirable gas to an aircrew respirator of the type having a hood with a cowl and visor adapted to envelop at least the face of a user and a mask for delivering respirable gas to the user, means for maintaining a

gas pressure within the hood but outside the mask greater than that outside the hood and for preventing misting of at least a portion of the visor, said apparatus comprising:

a control unit including an air supply manifold and an oxygen supply manifold and mountable in the region of the aircrewman's chest,

a flexible respirable air supply duct connected into said air supply manifold and adapted for connection to a filter/-blower unit,

a flexible mask supply duct connected to the said supply manifold and adapted for connection to the respirator mask,

a flexible hood supply duct connected to said air supply manifold and adapted for connection to the respirator hood cavity external to the mask,

a non-return valve lightly biassed closed in said hood supply duct approximate said control unit and permitting therein in use only flow of gas from said air supply manifold to the hood,

a flexible oxygen supply duct connected to said oxygen supply manifold,

a flexible mask oxygen supply duct contained within said mask supply duct, connected to said oxygen supply manifold, and terminating with an exit just upstream of the connection for said mask supply duct to the mask,

a restriction in said mask oxygen supply duct for controlling the flow of oxygen therethrough,

a flexible emergency hood gas supply duct contained within said hood supply duct connected to said oxygen supply manifold and having a restrictor therewithin and an exit in said hood supply duct downstream of said non-return valve,

a cock on said control unit for determining whether oxygen shall flow in said emergency hood gas supply duct, and

an anti-drowning facility whereby said mask supply duct can be manually disconnected from the respirator mask at the connection thereto,

the total capacity of said mask supply duct and said air supply manifold being such that sufficient oxygen can be stored therein between inspirations to ensure on inspiration a predetermined minimum within a range of partial pressures of oxygen in the respirable gas and surplus oxygen can enter said hood supply duct during prolonged non-inspiration.

4,404,970

HEMOSTATIC ARTICLE AND METHODS FOR PREPARING AND EMPLOYING THE SAME

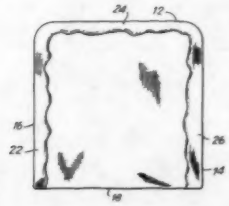
Philip N. Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 907,899, May 19, 1978, Pat. No. 4,238,480. This application Jul. 22, 1980, Ser. No. 171,191

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **12 Claims**



1. A hemostatic article prepared by a method comprising modifying one of the group consisting of a collagen substance or collagen-like substance by dissolving the substance in water and modifying the thereby dissolved substance to render the surface charge thereof effectively more positive than prior to modification whereby to provide augmented hemostatic properties thereto and freezing and drying the thereby modified substance in a porous body, said porous body having a normal structural strength and composition which is modified by said modified substance, the modified substance being blood-soluble such that upon subjecting the thereby modified substance in the porous body to blood, the modified substance goes into solution therein; the supporting body being so constructed and arranged that it resumes its normal strength and composition after the modified substance has gone into solution.

4,404,971

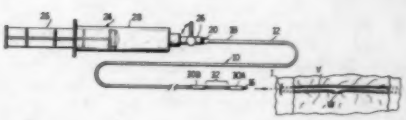
DUAL BALLOON CATHETER

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407; Eric G. LeVeen, 3-3 Woodlike Rd., Albany, N.Y. 12203, and Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147

Filed Apr. 3, 1981, Ser. No. 250,603

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—348.1 **1 Claim**



1. A method of closing an opening in a first blood vessel which comprises introducing the closed end of a catheter into a second blood vessel remote from and communicating with said first blood vessel; the said catheter being formed of an elongated tube having a central bore extending the length thereof, said bore being closed at one end of said catheter and having means for introducing a pressurized fluid into said bore at the other end of said catheter, said catheter further including first balloon forming structure disposed about said tube adjacent the closed end of said catheter, second balloon forming structure disposed about said tube spaced along the length thereof apart from said first balloon forming structure, each said balloon forming structure having an expandable cylindrical wall enclosing said tube and sealed at the ends thereof to said tube thereby trapping an annular closed space between said wall and said tube, and first and second ports in said tube communicating the interior bore thereof with said closed spaces trapped by said walls of said first and said second balloon forming structures, respectively; advancing said catheter in said blood vessels to a position in said first blood vessel with said first and second balloon forming structures disposed on opposite sides of said opening; introducing fluid under pressure into said catheter through said means at the other end of said catheter thereby causing said fluid to flow into said closed spaces and expanding said walls to an oblate shape blocking flow of blood in said first blood vessel; surgically closing said opening while retaining pressure on said fluid; removing pressure from said fluid after closing said opening thereby to deflate said balloon forming structures; and removing said catheter from said blood vessels.

4,404,972

IMPLANTABLE DEVICE WITH MICROPROCESSOR CONTROL

Pat L. Gordon, West Columbia; Richard V. Calfee, Houston, both of Tex., and Jay Miner, Sunnyvale, Calif., assignors to Intermedics, Inc., Freeport, Tex.

Filed May 18, 1981, Ser. No. 264,670

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **24 Claims**

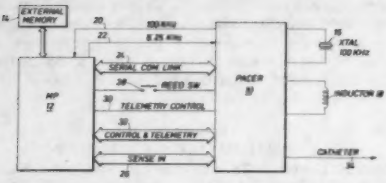
1. A method of reducing the power consumption of a microprocessor controlled system comprising the steps of:

(a) storing a wakeup parameter;

(b) operating the microprocessor in a sleep state wherein no

processing activity or a predetermined sleep processing activity occurs;

(c) generating event signals upon the occurrence of corresponding predetermined events; and



(d) operating the microprocessor with a processing activity increased with respect to the activity occurring during said sleep state, in response to a generated event signal which corresponds to the stored wakeup parameter.

4,404,973

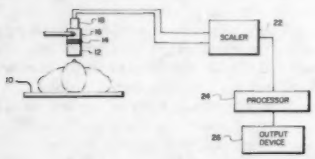
HEART MUSCLE EVALUATION METHOD AND APPARATUS

Jack Lancaster, 1410 Park East, Garland, Tex. 75043; John Floyd, 9620 Greensprint, Dallas, Tex. 75238, and William Harvey, 7016 Leameadow, Dallas, Tex. 75248

Filed Apr. 20, 1981, Ser. No. 255,895

Int. Cl.³ A61G 5/02

U.S. Cl. 128—654 **16 Claims**



1. An apparatus for evaluating the condition of the heart muscle for use in conjunction with means for injecting radioactive material into the bloodstream, said apparatus comprising:

a single roughly collimated radiation detector adapted to be positioned near the heart muscle for simultaneously detecting radiation both within the heart muscle and in the vicinity of the heart muscle;

means coupled to said detector for generating a plurality of signals indicative of the total amount of radiation detected; and

processor means for processing said plurality of signals and for distinguishing in response to said processing radiation detected within the heart muscle from radiation detected in the vicinity of said heart muscle.

4,404,974

METHOD AND APPARATUS FOR MONITORING AND DISPLAYING HEART RATE AND BLOOD PRESSURE PRODUCT INFORMATION

John S. Titus, Prior Lake, Minn., assignor to Possis Medical, Inc., Minneapolis, Minn.

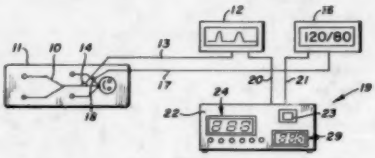
Filed Aug. 7, 1981, Ser. No. 291,023

Int. Cl.³ A61B 5/02

U.S. Cl. 128—670 **62 Claims**

1. A method of providing heart rate and blood pressure product information of a primate comprising:

sensing the heart rate of a primate, providing a first signal related to the sensed heart rate, sensing the systolic blood pressure of the primate simultaneously with the sensing of the heart rate of the primate, providing a second signal related to the systolic blood pressure simultaneously with the first signal, combining the first and second signals to produce current heart rate and systolic blood pressure product information and time delayed heart rate and systolic blood pressure product information, visually displaying current heart rate and systolic product information



and time average heart rate and systolic product information derived from the combined first and second signals, and actuating a recognizable alarm when the time average heart rate and systolic blood pressure information exceed a selected level.

4,404,975

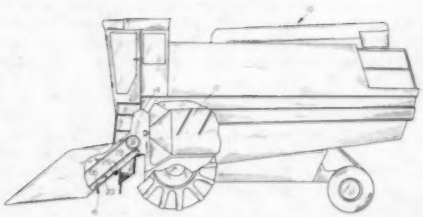
ROCK TRAP FOR A COMBINE

Roger L. Westby, Rte. 2, New Rockford, N. Dak. 58356

Filed Nov. 25, 1981, Ser. No. 324,762

Int. Cl.³ A01F 12/16

U.S. Cl. 130—27 JT **1 Claim**



1. In combination,

a crop harvester including a crop threshing means having rearward and forward ends, a feeder housing means, having rearward and forward ends, pivotally mounted on said crop harvester so that its rearward end is in communication with said crop threshing means, and a crop gathering means at the forward end of said feeder housing, said feeder housing comprising a top wall, a bottom wall, and opposite side walls, said bottom wall having its rearward end terminating forwardly of said crop threshing means to define an opening between the rearward end of said feeder housing and said crop threshing means,

a stone retarder panel having rearward and forward ends, said panel being pivotally secured, at its rearward end, to said crop harvester,

said panel embracing the underside of the upper end of said feeder housing to close said opening,

means securing the forward end of said panel to said feeder housing whereby said panel will pivotally move with said feeder housing,

said panel comprising a rectangular bottom portion having rearward and forward ends and opposite side wall portions which extend upwardly therefrom adapted to embrace said feeder housing, said bottom portion of said panel having a rectangular opening formed therein,

and a rock trap box means secured to said panel positioned below said rectangular opening for receiving rocks therein which are moving upwardly in said feeder housing means towards said crop threshing means,

said rock trap box means having an interior rock compartment which is in communication with the interior of said feeder housing,

said rock trap box means having a lower end which is selectively closed by a spring loaded door means,

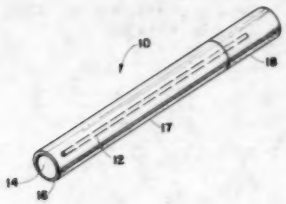
said lower end of said rock trap box being selectively opened to permit rocks accumulated therein to be dumped on the ground.

4,404,976

LOW DELIVERY CIGARETTE

Lawrence L. Stewart, Jr., Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,486
Int. Cl.³ A24D *1/00*
U.S. Cl. 131—339 **6 Claims**



1. A smoking article comprising:

a cylinder of smoking material;

a filter attached to said cylinder of smoking material; and

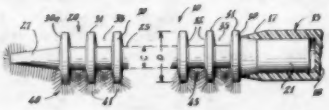
a tube of heat fusible material extending from near one end of said smoking material, to the junction of said smoking material and said filter, said tube being open at both ends for conveying virtually unfiltered, undiluted smoke the length of said tube.

4,404,977

COSMETICS BRUSH

Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

Filed Sep. 14, 1981, Ser. No. 301,636
Int. Cl.³ A45D *40/26*
U.S. Cl. 132—88.7 **20 Claims**



1. A cosmetics applicator brush comprising:

(A) a rod;

(B) a flexer positioned at the end of said rod, the flexer having outwardly extending rib portions defining grooved portions therebetween; and

(C) bristles secured to the exterior of said ribbed flexer and extending outwardly therefrom, said bristles deployed on both of said rib and grooved portions.

4,404,978

BI-STRING DENTAL FLOSS HOLDER

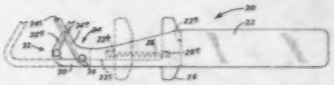
David L. Withers, 3424 Archer Ct. N.W., Salem, Oreg. 97304

Filed Mar. 10, 1982, Ser. No. 356,773
Int. Cl.³ A61C *16/00*
U.S. Cl. 132—91 **17 Claims**

4. A tool of the type using dental floss or the like for use in flossing teeth comprising

an elongate handle,

a pair of double-pronged fork members joined to said handle, each member having a pair of spaced-apart prongs constructed to receive a length of a run of floss extended between extremeties of the prongs in the pair, with lengths of floss so received by said two members residing in spaced-apart, generally parallel, confronting relationship,



said fork members being structured for simultaneously and unobstructedly disposing such supported lengths of floss adjacent common-jaw tooth surfaces, and

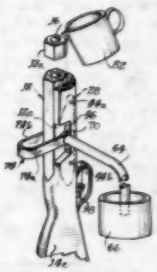
for each fork member, means for anchoring opposite ends of a floss run associated with a length of floss extended between the extremeties of the associated prongs, thus to facilitate tensioning of such a length.

4,404,979

APPARATUS FOR CLEANING THE BORE OF A FLINTLOCK MUZZLELOADING RIFLE

Larry R. Hobbs, 611 S. Amy La., Idaho Falls, Id. 83401

Filed Sep. 9, 1981, Ser. No. 300,647
Int. Cl.³ B08B *9/00*
U.S. Cl. 134—166 C **6 Claims**



1. Apparatus for use in cleaning the longitudinal bore in a barrel of a flintlock muzzleloading type rifle wherein the barrel is mounted on a stock and has an exposed touchhole opening communicating with the longitudinal bore, said apparatus comprising;

a drain member having a flow passage therethrough intersecting at least one end and defining a fluid entry opening at said one end,

seal means mounted on said drain member adjacent said one end and having an annular sealing surface adapted for sealing engagement with said barrel peripherally of said exposed touchhole opening, said seal means having a flow passage communicating with said touchhole and with said flow passage in said drain member,

and mounting means attached to said drain member and enabling releasable mounting of said drain member and sealing means on said barrel and stock with said annular sealing surface engaging said barrel peripherally of said touchhole opening so that cleaning fluid introduced into the muzzle end of the longitudinal bore is discharged through said touchhole and through said drain member.

4,404,980

ARCHED SUPPORT STRUCTURE WITH COVER

Mark W. Wade, Boynton Beach, Fla., assignor to James Nemec, West Palm Beach, Fla.

Filed Sep. 30, 1980, Ser. No. 192,189
Int. Cl.³ A45F 1/16
U.S. Cl. 135—102 6 Claims

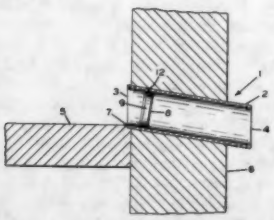
1. A portable shelter including a plurality of laterally spaced apart and downwardly opening arched plastic pipe members of generally 180° in angular extent, a flexible covering disposed over and supported from said pipe members in arched configuration, the concave inner side of said cover including means defining flexible sleeve portions carried thereby and through which said pipe members extend, the upper portions of said pipe members having longitudinally extending stiffening rods disposed therein to prevent flattening or peaking of the upper portions of said pipe members, means carried by said pipe members preventing longitudinal displacement of said rods in said pipe members, a pair of elongated tubular bars extending between corresponding ends of said pipe members and having upwardly opening apertures formed therein downwardly into which the ends of said pipe members extend with the terminal ends thereof abutted against the inner surface portions of said tubular bars opposite said apertures, ground anchor means supported from said tubular bars for anchoring the latter to the ground, elongated horizontal anchor means carried by said cover, extending transversely of said sleeve portions and spaced above each of said tubular bars, and elongated elastic tension members anchored at one set of corresponding ends to said anchor means adjacent a corresponding sleeve portion and anchored at their other set of corresponding ends to the corresponding tubular bar adjacent the corresponding sleeve portion.

4,404,981

SCUPPER DEVICE

James P. Valenti, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 16, 1982, Ser. No. 348,849
Int. Cl.³ F16K 13/04
U.S. Cl. 137—67 5 Claims



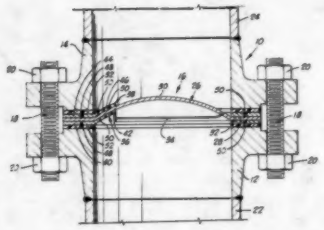
1. In combination, a scupper device comprising a pipe having a water inlet opening at one end and a water discharge opening at the other end, said pipe being adapted to be installed through a building wall at the edge of a floor therein, with the inlet opening in a position to receive water from the floor, said discharge opening being positioned in a plane below that of the inlet opening, a retaining ring frictionally held in position in said pipe adjacent the water inlet opening therein, a single, water-soluble sealing film having a main body portion covering at least one side of said retaining ring to exclude air movement through the pipe when no water is present and, by dissolving when water is present, allow passage of water from the inlet opening through the pipe to the discharge opening thereof.

4,404,982

RUPTURABLE PRESSURE RELIEF APPARATUS

Sam A. Ou, Bixby, Okla., assignor to BS&B Safety Systems, Ltd., Limerick, Ireland

Filed Feb. 10, 1982, Ser. No. 347,472
Int. Cl.³ F16K 13/04
U.S. Cl. 137—68 R 14 Claims



1. A rupturable pressure relief apparatus adapted to be clamped between inlet and outlet annular support members comprising:

a rupture disk having an annular flange portion connected to a concave-convex portion by a circular transition connection, the concave-convex portion including a groove in a side thereof creating a line of weakness therein;

at least one concave-convex hinge reinforcing member attached to a side of said concave-convex portion of said rupture disk having a shape and positioned adjacent a portion of said concave-convex portion of said rupture disk whereby upon rupture, said concave-convex portion of said rupture disk tears along said line of weakness created by said groove and bends about an integral untorn portion corresponding with said hinge reinforcing member.

4,404,983

MOTOR VEHICLE FUEL TANK WITH HEAT RESPONSIVE CLOSURE MEANS

Dieter Scheurenbrand, Ostfildern, and Einhard Kleinschmit, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

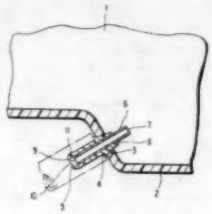
Filed Oct. 24, 1980, Ser. No. 200,578
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942922
Int. Cl.³ F16K 17/38
U.S. Cl. 137—74 9 Claims

1. A fuel tank for motor vehicles, the tank being potentially subject to excessive heat, the fuel tank including at least one connecting socket means having a fluid outlet for enabling a connecting of a fuel line to the fuel tank, the connecting socket means being arranged in a lower zone of the fuel tank and including an axially extending bore, and comprising

a metal sleeve means arranged in the bore of the connecting socket means so that an inner end of the metal sleeve

means freely projects into an interior of the fuel tank beyond an inner end of the connecting socket means for transmitting heat to said interior at a greater rate than the heat transmitting rate of the socket means,

an outer end of the metal sleeve means is located within and axially spaced from an outer end of the connecting socket means,



the connecting socket means having a greater capacity than the metal sleeve means to deform for sealing the fluid outlet upon application of excessive heat and upon application of excessive heat the connecting socket means deforms to seal the fluid outlet.

4,404,984

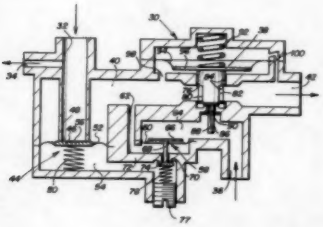
GAS-LIQUID MIXING METERING SYSTEM

James S. Jones, 45 Crown Pl., Richardson, Tex. 75080

Continuation of Ser. No. 155,931, Jun. 3, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,533

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—88 **13 Claims**



1. A blender of gas and liquid fuels from a gas source and from a liquid fuel supply reservoir and having a gas inlet, and an outlet which comprises:

a servo valve to open and close said gas inlet;

a throttle valve;

means to apply fuel gas under pressure to one side of said throttle valve;

means for connecting said inlet to said liquid fuel supply reservoir to supply liquid fuel under the pressure of said gas source to the other side of said throttle valve;

means including a variable proportioning device between said inlet and outlet responsive to reduction of gas pressure at said outlet to reduce the gas pressure on said throttle valve to open said servo valve and supply fuel gas from said inlet to said proportioning device; and

variable passage means between said outlet and said other side of said throttle valve to entrain proportional liquid flow with gas flow in said outlet dependent upon the pressure difference between said outlet and said other side of said throttle valve.

4,404,985

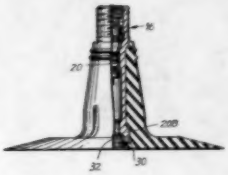
AIR-LIQUID VALVES FOR OFF-THE-ROAD VEHICLE TIRES

Carl Stasiunas, Altavista, Va., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 144,517, Apr. 12, 1980, abandoned. This application Oct. 8, 1981, Ser. No. 309,741

Int. Cl.³ F16K *15/20*

U.S. Cl. 137—234.5 **1 Claim**



1. In a valve device having a longitudinal axis, comprising a rubber body having a tubular stem portion and, integral therewith, a base member; a tubular metal insert having a bore; a valve core disposed within the bore of said insert, the insert extending to the lower end of said rubber body and being substantially encased therein; first and second thickened wall portions for said tubular metal insert spaced between a third, thin wall portion of substantially constant inner diameter, the first thickened wall portion being adjacent to and located upwardly of the lower end of said valve core, the second thickened wall portion being adjacent the lower end of said insert and having interior and exterior lower surfaces, whereby said bore for the passage of fluid comprises a first part defined by said thin wall portion of constant inner diameter, and a second part defined by the second thickened wall portion at which the bore diameter is lessened; the improvement comprising:

a hook-like annular projection at the lower end of said insert, said hook-like annular projection being completely surrounded by the rubber of said body so that the interior portion of rubber defines a continuing third part of said bore, the diameter of the third bore part defined by said interior portion of rubber being at least as great as the substantially constant inner diameter of the thin wall portion of said insert between said first and second thickened wall portions, the interior lower surface of said second thickened wall portion being tapered downwardly outwardly; further, in which said hook-like annular projection is thinner than said second thickened wall portion, and extends downwardly for a short distance from approximately a central location between the interior and exterior lower surfaces of said second thickened wall portion and then is curved outwardly of said valve axis, and in which said interior portion of rubber extends upwardly so as to contact said tapered interior lower surface of said second thickened wall portion above said hook-like annular projection;

further, in which the diameter of said interior portion of rubber decreases with distance toward the lower end of said rubber body.

4,404,986

TAKE UP SYSTEM FOR LONG LENGTHS OF HIGH PRESSURE HOSE

James B. McKnight, Louisville, Ga., assignor to Fulghum Industries, Inc., Wadley, Ga.

Filed Jan. 13, 1981, Ser. No. 224,822

Int. Cl.³ B65H *75/34, 51/20*

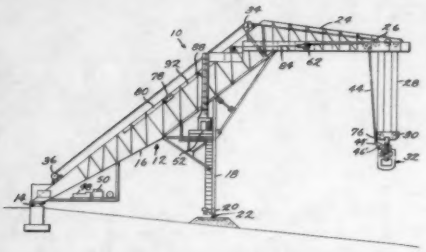
U.S. Cl. 137—355.17 **4 Claims**

1. In a high pressure system having two flexible resilient hoses for alternately supplying fluid under high pressure from a fixed source thereof to, and alternately exhausting the fluid

from, a double acting fluid motor movable relative to the source, the combination of a take-up system for maintaining said hoses slack-free comprising:

fixed means connecting one end of each of said hoses to the source with the hoses extending from said means to the motor with a length equal to at least the maximum distance between said fixed means and the motor;

flexible line means extending between and connecting said hoses intermediate their ends;



a movable counterweight; and

means connecting said counterweight with said line means, said connecting means being movable along an intermediate length of said line means, whereby alternate stretching and alternate contracting of said hoses, occasioned by the alternative supply of high pressure fluid thereto and alternative exhaust of the fluid therefrom may take place without substantial movement of said counterweight.

4,404,987

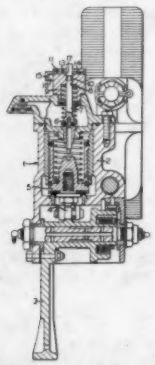
CAP NUT FOR A TRIP COCK DEVICE INCLUDING A DETENT ARRANGEMENT FOR OVERRIDING AUTOMATIC RESET

Robert J. Bridigum, Plum Township, Allegheny County, and William S. Johnston, Forest Hills Borough, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Sep. 24, 1981, Ser. No. 305,236

Int. Cl.³ F16K *37/00, 31/00, 31/524*

U.S. Cl. 137—556 **3 Claims**



1. A cap nut assembly for installation in a railway trip cock device, such trip cock device of the type having a trip lever engageable with a trip arm supported adjacent a railroad track section, such trip lever having a cam portion which causes upward movement of a piston as such trip lever is rotated, a pilot valve seat member disposed in such trip cock device above such piston and axially movable upward upon upward contact with such piston, said cap nut assembly comprising:

a cap nut member having a threaded portion adapted to insert into a threaded bore in such trip cock device axially above such pilot valve seat member; said cap nut member having a coaxial through bore;

a pilot valve stem member axially reciprocably movable in said through bore and having formed thereon an annular groove;

at least one detent member operably disposed in said cap nut member;

biasing means disposed in said cap nut member for biasing said detent member in a direction transversely to said through bore and engaging said groove; said stem having pilot valve means on the end opposite said groove and at a predetermined axial distance from said groove for engaging such pilot valve seat member in such trip cock device; and

said predetermined axial distance being such that upward movement of said pilot valve means by said pilot valve seat member to an unseated position situates said detent member adjacent to said groove axially arresting said stem such that at least a portion of said stem extends axially outward of said through bore in said cap nut member to indicate a tripped condition of such trip cock device.

4,404,988

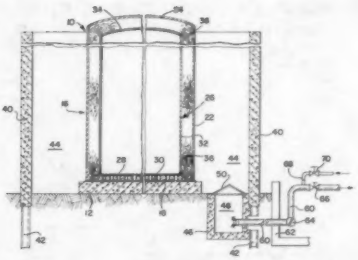
PRESSURE SEATED CLOSURE FOR CONTAINMENT DRAIN

Joel H. Trammell, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 16, 1981, Ser. No. 331,213

Int. Cl.³ E03B *5/00*

U.S. Cl. 137—565 **6 Claims**



1. Apparatus for draining a liquid which has been inadvertently freed from a primary storage container and captured in a containment space comprising:

a drain conduit extending from the containment space to a remote location, with said drain conduit having an opening in a lower part of the containment space into which captured liquid can flow by gravity when not closed;

a valve, in the drain conduit, outside of the containment space;

a pressurization line, containing a valve, communicating with the drain conduit between the drain conduit valve and the conduit opening;

a closure in the drain conduit opening adapted to bar flow of captured liquid into the drain conduit; and

closure retainer means releasably securing the closure in the drain conduit opening;

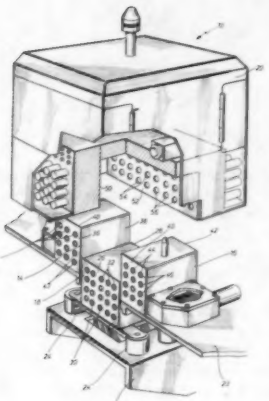
whereby when it is desired to remove captured liquid from the containment space the pressurization line valve can be opened and fluid under pressure can be fed to the pressurization line which delivers it to the drain conduit with the drain conduit valve closed so that the resulting pressure against the inside surface of the closure can force it out of the opening following which the pressurization line valve can be closed and the drain conduit valve opened to remove captured liquid from the containment space.

4,404,989

UNDERWATER CONNECTOR FOR FLUID LINES

Joseph L. LeMoine, Houston, Tex., assignor to Koomey, Inc., Brookshire, Tex.

Filed Aug. 3, 1981, Ser. No. 289,566
Int. Cl.³ F16L 29/00
U.S. Cl. 137—596.18 5 Claims



1. An underwater connector for interconnecting a plurality of fluid lines comprising,

a first member adapted to be positioned underwater, said member including at least one upright positioned flat side having a plurality of fluid passageways terminating at said side,

a second member adapted to engage and disengage from said first member, said second member including at least one upright positioned flat face for alignment with but spaced from the first member flat side when engaged for providing a venting space therebetween and having a plurality of passageways terminating at said second member flat face for axial alignment with the first member passageways,

a valve seat releasably connected to the first member flat side about each of the first member passageways,

a valve positioned in each of the second member passageways having a movable valve element, and having a hydraulic fluid supply port, and pilot actuated means connected to and actuating the valve element, and

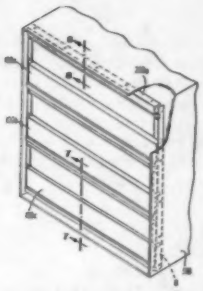
said valve element when moved to one position seats on the valve seat on the first member and opens the fluid supply port for providing actuating fluid to the second member, and when moved to a second position closes the fluid supply port and is removed from the valve seat for allowing fluid in the first member to vent into said space.

4,404,990

ECONOMY, ANGLE-BLADE DAMPER KIT

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

Division of Ser. No. 74,290, Sep. 11, 1979, Pat. No. 4,277,870, which is a division of Ser. No. 891,330, Mar. 20, 1978, Pat. No. 4,185,657, which is a continuation-in-part of Ser. No. 874,001, Jan. 31, 1978, Pat. No. 4,165,629, Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,114,646, Ser. No. 770,631, Feb. 22, 1977, Pat. No. 4,113,230, and Ser. No. 729,831, Oct. 4, 1976, Pat. No. 4,113,232, said Ser. No. 874,001, is a continuation-in-part of Ser. No. 736,823, Oct. 18, 1977, Pat. No. 4,080,060, which is a continuation-in-part of Ser. No. 650,926, Jan. 21, 1976, Pat. No. 4,004,480, said Ser. No. 764,774, is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 770,631, and Ser. No. 729,831, each is a continuation-in-part of Ser. No. 689,994,. This application Dec. 18, 1980, Ser. No. 217,765
The portion of the term of this patent subsequent to Feb. 29, 1997, has been disclaimed.
Int. Cl.³ F24F 13/14
U.S. Cl. 137—601 1 Claim



1. A kit for constructing a damper inside an opening, said kit comprising:

a. blade stock having a hook-shaped hinge portion formed therein, said hook-shaped hinge portion extending uniformly across substantially the entire longitudinal length of said blade stock; and

b. notched angle stock for two opposing sides of said opening, said notched angle stock comprising at least one transverse portion and one face strip portion, said face strip portion having opposing, periodically spaced hook-shaped hinge elements formed therealong for receiving and, upon pivoting of the blade when received thereby, for slidingly engaging portions of said hook-shaped hinge portion of said blade stock, said opposing, periodically spaced hook-shaped hinge elements being adapted to alternatively receive the right and left hand ends of said blade stock, and said transverse portion having means for use in attaching said stock to an interior surface of said opening, said notched angle stock being easily cut and fastened within said opening.

4,404,991

VALVE CONTROL ASSEMBLY

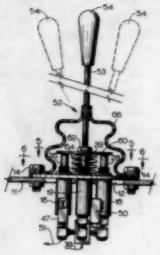
Mark Cullen, Rossford, Ohio, assignor to Donahue Esterprises, Inc., Minneapolis, Minn.

Filed Sep. 29, 1982, Ser. No. 427,929
Int. Cl.³ F16K 11/18
U.S. Cl. 137—636.1 17 Claims

1. A fluid control apparatus comprising:

support means having circular edge means surrounding a hole, a plurality of valve means mounted on the support means, each of said valve means having a movable actua-

tor spaced from said hole, said actuator being movable between an open first position allowing fluid to flow through the valve means and a closed second position blocking flow of fluid through the valve means, control means cooperating with the support means and each actuator operable for selectively moving one or more of said actuators from the first position to the second position, said control means having a first member located in said



hole and engageable with said edge means, rod means secured to the first member, a second member mounted on the rod means engageable with said actuators, and biasing means located around the rod means engageable with the support means and second member to bias the first member into bearing engagement with the circular edge means and the rod means to a neutral position wherein the actuators are in the second position.

4,404,992

COMPOSITE DUAL TUBING

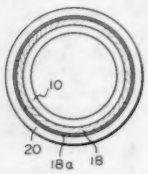
Takesada Sasaki, Machida; Hiroshi Endo, Zama; Yoshimasa Zama, Sagamihara; Masahiko Shiraishi, Nakatsu; Yosinari Miura, Nakatsu, and Masayuki Yamaguchi, Nakatsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,050

Claims priority, application Japan, Sep. 9, 1980, 55-125011; Sep. 10, 1980, 55-125845

Int. Cl.³ F16L *9/14*

U.S. Cl. 138—140 **8 Claims**



1. An exhaust pipe for discharging hot gases from an internal combustion engine comprising:

a metallic dual tubing having an inner tube spaced from an outer tube;

an intermediate layer filling the space between the inner tube and the outer tube;

said intermediate layer comprising a combustible material which combusts at the temperature of the hot gases to be discharged from said engine;

whereby upon exposing said exhaust pipe to said temperature of the hot gases to be discharged said combustible material combusts thereby providing a gap between said inner and outer tube.

4,404,993

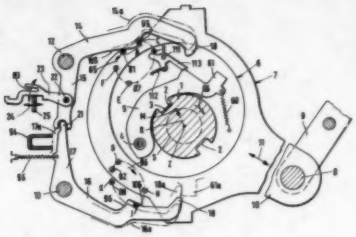
CLUTCH ARRANGEMENT FOR CONTROLLING A HEDDLE OF A WEAVING MACHINE

Werner Julich, Wallisellen, and Gunter Müller, Wiesendangen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 16, 1981, Ser. No. 312,151

Int. Cl.³ D03C *1/00*

U.S. Cl. 139—66 R **5 Claims**



1. A clutch arrangement for controlling a heddle of a weaving machine, said arrangement comprising

an intermittently rotatable drive shaft having at least one slot therein;

an eccentric rotatably mounted on said shaft;

a pawl mounted on said eccentric for engagement in said slot of said shaft;

a link disposed about said eccentric for movement in an orbital manner about said shaft to impart a reciprocating movement to a connecting rod for driving a heddle with said pawl engaged in said slot;

at least one control lever movable between a blocking position in the path of said pawl and a release position spaced from said pawl;

a bar connected to said control lever;

a stroke meter drive for moving said bar to cause said lever to move between said positions; and

at least one stop element mounted on said link for engaging said control lever during rotation of said eccentric to maintain said control lever in said release position during at least part of said orbital movement of said link.

4,404,994

SQUEEZE ROD HOOK

Stephen J. Root, Mauldin, and Charles F. Kramer, Greenville, both of S.C., assignors to Steel Heddle Manufacturing Co., Greenville, S.C.

Filed Jan. 27, 1982, Ser. No. 343,052

Int. Cl.³ D03C *9/06*

U.S. Cl. 139—91 **10 Claims**

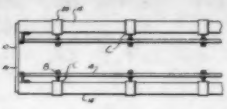
1. A heddle rod support device for supporting a heddle rod on an associated heddle frame of a weaving loom comprising:

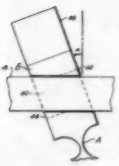
a main body portion adapted for attachment to said heddle frame;

flexible neck means carried by said main body portion;

resilient slot means carried by said neck means squeezing and holding said heddle rod firmly in a support position when said neck means is generally upright; and

said slot means having a receiving position when said neck means is flexed wherein said slot means is open for receiving said heddle rod and thereafter returnable to said support position.





4,404,995

HEDDLE FRAME ASSEMBLY CONSTRUCTION AND METHOD

James B. Bowen, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Manufacturing Co., Greenville, S.C.

Filed Apr. 10, 1981, Ser. No. 252,859
Int. Cl.³ D03C 9/06; B23P 11/00
U.S. Cl. 139—92 5 Claims

1. A method of constructing a heddle frame assembly to eliminate dimensional variations in the assembly and increase the integrity thereof wherein the heddle frame assembly is of the type having top and bottom frame slats on which heddle rods are affixed on which end eyes of the heddles are slidably carried, wherein the improvement comprises:

welding a plurality of studs having a uniform effective rivet length to said heddle rods at spaced intervals along the length thereof providing an integral unitary construction therebetween and eliminating dimensional variations in said assembly due to variations in the thickness of the heddle rods and in the depth of countersinks in the face thereof;

providing corresponding spaced uniformly dimensioned countersink openings in a portion of said frame slats for receiving said studs;

placing said studs into said openings;

peening the ends of said studs in said openings to form a rivet head and secure rivet connection between each said heddle rod and corresponding heddle frame slat;

whereby a more rigid and accurate construction and assembly is provided which eliminates weak connection points and affords a smooth face for free wear-resistant heddle travel along the length of said heddle rod.

5. A heddle frame assembly of the type which includes top and bottom frame slats on which are affixed heddle rods which slidably support the end eyes of the heddles wherein the improvement comprises:

a plurality of studs having a standard effective length for forming a rivet;

a pointed projection carried at one end of each said stud;

said studs being welded to said rods at spaced intervals over the length thereof in a manner in which the effective length of said studs is unchanged providing uniform spacing between said heddle rod and frame slat affixed thereto;

a plurality of correspondingly spaced uniformly dimensioned countersink openings formed in said heddle frame slat;

said heddle rod and slat being integrally formed by heading said studs in said countersink openings to provide an accurately dimensioned rivet connection and reliable assembly; and

the face of said heddle rod being smooth and completely unbroken facilitating free travel of the end eyes of said heddles thereover;

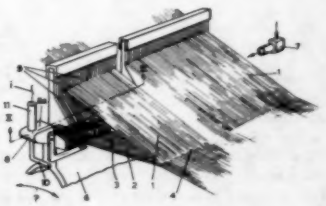
whereby dimensional variations in the thickness of the heddle rod and countersinks formed in the face thereof are eliminated in the construction of said assembly increasing the structural integrity thereof.

4,404,996

METHOD FOR INSERTING AND STRETCHING A MEASURED WEFT YARN LENGTH INTO THE WEAVING SHED OF A SHUTTLELESS WEAVING MACHINE

Petrus G. J. Manders, Eindhoven, Netherlands, assignor to Ruti-Te Strake B.V., Netherlands

Filed Jul. 27, 1981, Ser. No. 287,155
Claims priority, application Netherlands, Aug. 11, 1980, 8004551
Int. Cl.³ D03D 47/34, 47/28
U.S. Cl. 139—194 2 Claims



1. A method of inserting and stretching a measured weft thread length in the weaving shed of a shuttleless weaving machine, comprising the step of transporting the thread length through the shed by means of a transport air jet injected into one end of the shed, wherein the improvement comprises the steps of passing the transport air jet, at the other end of the shed, into an inlet formed in a receptacle which has an outlet in the form of a mixing tube extending at an angle to the axis of the transport air jet, the end of the receptacle opposite to said inlet being closed and the wall of the receptacle opposite to said outlet being inclined to the axis of the transport air jet at such an angle as to deflect said transport air jet into said outlet, and injecting a concentrated auxiliary air jet into said outlet along the axis of said mixing tube.

2. A shuttleless weaving machine comprising two sheets of warp threads which are momentarily held in diverging planes to form a weaving shed, and a blowing nozzle arranged at one end of the shed for injecting a transport air jet to transport a measured weft thread length through the shed, wherein the

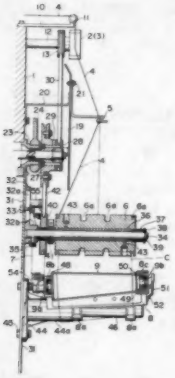
improvement comprises a receptacle at the other end of the shed, having an inlet aligned with the transport air jet to receive said jet, and having an outlet in the form of a mixing tube extending at an angle to the axis of the transport air jet, the end of the receptacle opposite to said inlet being closed and the wall of the receptacle opposite to said outlet being inclined to the axis of the transport air jet at such an angle as to deflect said transport air jet into said outlet, and an auxiliary blowing nozzle arranged to inject an air jet into said outlet along the axis of said mixing tube to stretch the thread length in the shed.

4,404,997

WASTE BINDING YARN TAKE-UP DEVICE FOR SHUTTLELESS LOOM

Masayuki Ushiro, Tokyo, and Takeki Tsubokura, Koganei, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 13, 1981, Ser. No. 253,569
Claims priority, application Japan, Apr. 12, 1980, 55-47479
Int. Cl.³ D03D *49/00*
U.S. Cl. 139—291 R **9 Claims**



1. A waste binding yarn take-up device for a shuttleness loom, comprising:

traction means for pulling waste binding yarns at a constant traction speed;

a rotary traverse roller formed at the outer surface thereof with a guide groove along which said waste binding yarns from said traction means are guided, the said guide groove being arranged to impart a traversing motion to said yarns;

means for rotating said traverse roller at a peripheral velocity slightly higher than the traction speed of said traction means;

a rotatable core member on which the waste binding yarns from said traverse roller is capable of being wound; and

means for biasing said rotatable core member and the waste binding yarns wound thereon into contact with said traverse roller.

8. A method of taking up a waste binding yarn in a shuttleness loom, comprising the following steps of:

pulling waste binding yarns at a constant traction speed by using a traction device;

imparting traverse motion to said waste binding yarns from said traction device by using a rotary traverse roller;

rotating said traverse roller at a peripheral velocity slightly higher than said traction speed of said traction device; and

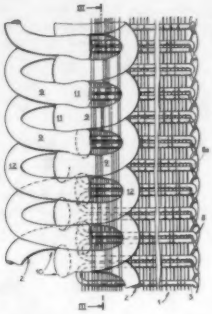
winding up said waste binding yarns from said traverse roller to form a cheese on a rotatable core member which is biased to be contactable with said traverse roller.

4,404,998

WOVEN SLIDE FASTENER STRINGER

Alfons Fröhlich, and Karl Griessbaum, both of Essen, Fed. Rep. of Germany, assignors to Opti Patent-, Forschungs- und Fabrikations AG, Riedern-Allmeind, Switzerland

Continuation-in-part of Ser. No. 33,224, Apr. 25, 1979, Pat. No. 4,334,556. This application Oct. 23, 1980, Ser. No. 199,831
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818383; Apr. 27, 1978, 2818508; Apr. 27, 1978, 2818509
Int. Cl.³ D03D *1/00*; A44B *19/34*
U.S. Cl. 139—384 B **5 Claims**



1. A slide fastener stringer half comprising a woven tape and a continuous monofilament coupling element interwoven with said tape, said tape being formed with a ground weft comprised of a plurality of double-pick weft insertions extending transversely of said tape and interlaced with warp yarns, said coupling element being formed of double-pick weft insertions and being provided with a multiplicity of coupling members each having a head overhanging an edge of said tape and a pair of shanks extending inwardly from said edge, said head and the respective shanks being integrated in the double-pick weft insertion of the coupling element, said warp yarns including connective warp threads interlaced with the double-pick weft insertions of said ground weft and with the double-pick weft insertions of said coupling element inwardly of said edge of said tape such that the warp threads pass over and under said double-pick weft insertions in a staggered pattern and each of said warp threads passes in succession over only a single double-pick weft insertion of said coupling element, under two successive double-pick weft insertions of the ground weft, and between the next two double-pick weft insertions of the ground weft and a double-pick weft insertion of said coupling element before entering a pattern repeat, a respective double-pick weft insertion underlying each double-pick weft insertion of said coupling element, and a further double-pick weft insertion of said ground weft being disposed between successive double-pick weft insertions of said coupling element.

4,404,999

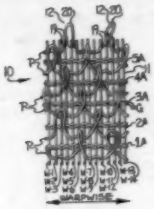
LOOP PILE FABRIC

Leigh C. Woodall, Jr., Roxboro; John T. Hayes, Durham, and Robert G. Currier, Roxboro, all of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,709
Int. Cl.³ D03D *27/00*
U.S. Cl. 139—391 **19 Claims**

1. A pile fabric comprising a woven backing fabric and pile yarns interwoven with said backing fabric at spaced intervals and extending from one face thereof to form a pile comprised of a multiplicity of pile loops, the pile loops being arranged in rows lengthwise of the fabric with the pile loops in any given row being staggered relative to the pile loops in the adjacent rows on each side thereof and with the loops in said adjacent rows also being staggered relative to one another to provide a

nonaligned appearance to the respective pile loops, the pile loops extending substantially upright from the backing fabric and being randomly oriented relative to one another to provide a random appearance and a substantially nondirectional grain to the pile, and the density of the pile loops and the size of the



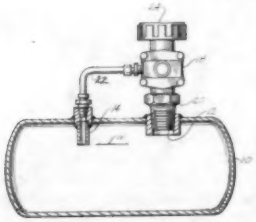
pile yarns forming the pile loops being such that each pile loop has the major portion thereof out of contact with the adjacent surrounding pile loops and substantially the totality of each pile loop is readily visible to provide substantial void volume within the pile of the fabric.

4,405,000

AUTOMATIC SHUTOFF VALVE

William J. Fuller, Fullerton, Calif., assignor to Auto Stop Corporation, Lynwood, Calif.

Filed Aug. 24, 1981, Ser. No. 295,767
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—198 **17 Claims**



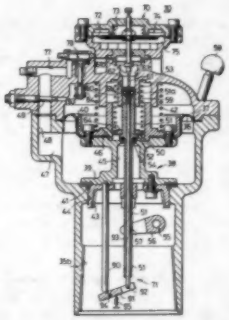
7. A storage system for a volatile liquid comprising:
a storage tank having an inlet;
a dip tube extending into the tank to a maximum fill level;
a valve body;
a main inlet, a main outlet, and a main passage from the main inlet to the main outlet formed in the valve body;
means for connecting the main outlet to the tank inlet;
a piston chamber formed in the valve body, the piston chamber having a valve seat in the main passage, a piston movable through the piston chamber between a first position in engagement with the valve seat to close the main passage and a second position out of engagement with the valve seat to open the main passage;
a first seal between the piston and piston chamber creating on the piston a first area against which fluid pressure in the main passage acts to urge the piston toward its second position;
a control chamber in fluid communication with one end of the piston chamber;
an actuator movable through the control chamber between a first position and a second position to drive the piston toward its first position when the actuator moves towards its first position and to be driven by the piston towards its second position when the piston moves towards its second position;
a second seal between the actuator and the control chamber creating on the actuator a second area larger than the first area against which fluid pressure in the control chamber acts to urge the actuator towards its first position; and
means for generating a sufficient pressure in the control chamber responsive to liquid in the dip tube to overcome the force of the liquid pressure exerted on the first area, thereby driving the actuator toward its first position, without generating sufficient pressure in the control chamber to do so responsive to gas in the dip tube.

4,405,001

OVERFLOW PREVENTING VALVE APPARATUS

Shigeo Sugiyama, Fujisawa; Masahiro Soya, Kawasaki, and Tugio Nagashima, Yokosuka, all of Japan, assignors to Tokico Ltd., Japan

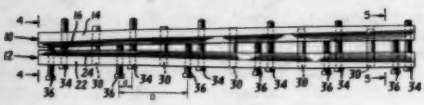
Filed Sep. 16, 1981, Ser. No. 302,833
Claims priority, application Japan, Sep. 16, 1980, 55-131373
Int. Cl.³ B65B *57/14*
U.S. Cl. 141—220 **8 Claims**



1. An overflow preventing valve apparatus comprising:
a valve main body provided at a terminal end of a fluid supplying passage, said valve main body comprising drop pipe means and fluid level detection pipe means;
a main valve fixed to a separating membrane stretched within said valve main body to separate an upper chamber and a lower chamber, said upper chamber being coupled to said fluid supplying passage through throttle valve means, said lower chamber being coupled to said fluid supplying passage and said drop pipe means, said main valve being movable according to a pressure difference between said upper and lower chambers and allowing fluid to flow to said drop pipe means from said fluid supplying passage in an open state;
a pilot valve provided in said main valve, said pilot valve being opened upon starting of a fluid supplying operation and opening said main valve by allowing fluid within said upper chamber to flow to said drop pipe means;
a lock mechanism for locking said pilot valve in the open state, said lock mechanism comprising stopping balls fitted into holes which are provided in radial directions of said pilot valve, a needle urging said stopping balls to move radially outward, and a stopping part provided at a part of said valve main body, for stopping said stopping balls which are urged to move radially outward, said pilot valve locked by said locking mechanism being released and closed when said needle is displaced so that said stopping balls become movable radially inward;
a first lock releasing mechanism responsive to said fluid level detection pipe means, for displacing said needle according to a predetermined fluid level detected by said fluid level detection means and releasing said pilot valve locked by said lock mechanism to close said pilot valve; and
a second lock releasing mechanism responsive to stoppage of fluid supply, for displacing said needle according to clos-

ing of said main valve due to pressure reduction in said lower chamber caused by the stoppage of the fluid supply and releasing said pilot valve locked by said lock mechanism to close said pilot valve.

4,405,002
PLANING FORM
Giordano Catalano, 46 Lindsley Ave., Irvington, N.J. 07111
Filed Oct. 8, 1981, Ser. No. 309,825
Int. Cl.³ B23Q *3/00*
U.S. Cl. 144—2 R **11 Claims**



1. A form for taper planing elongated wooden strips comprising:

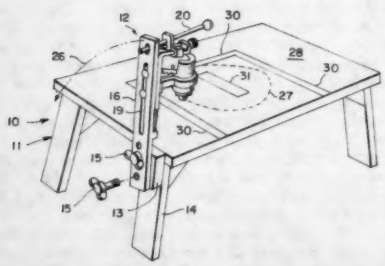
(a) a pair of elongated members, each such member having a longitudinally extensive beveled surface;

(b) means for retaining said members in opposed relation with one another so that said beveled surfaces cooperatively define an elongated groove of generally V-shaped cross section and said members being moveable towards and away from one another to vary the width of said groove;

(c) a plurality of adjusting screws each having a head and a threaded shank, the head of each such adjusting screw engaging one of said members, the shank of each such adjusting screw extending laterally of said members and threadedly engaging only the other one of said members; and

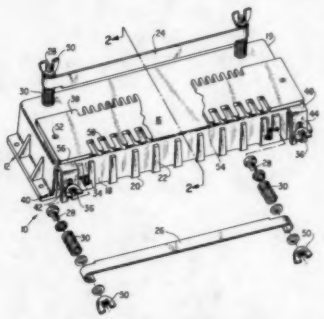
(d) a plurality of lock screws, each such lock screw extending laterally of said members, threadedly engaging only one of said members and bearing upon the other one of said members, there being one such lock screw adjacent to each one of said adjusting screws, whereby each of said adjusting screws together with the associated one of said lock screws may be operated to adjust and control the distance between said members in the vicinity of such adjusting screw.

4,405,003
UNIVERSAL TABLE
Woodroe Watson, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007
Filed Jan. 29, 1981, Ser. No. 229,761
Int. Cl.³ B27C *9/04*
U.S. Cl. 144—35 R **1 Claim**



1. A universal table, comprising in combination, table member and a fixture pivotally mounted on said table, said table including a table top supported upon legs, a turntable at a center of said table top carrying a hand skill saw secured to an underside thereof, and a portable electric drill mounted on said fixture, wherein said fixture comprises a post, a bracket mounted slidably along a slot in said post carrying said portable electric drill, and a pivotable lever mounted on said post vertically above said bracket engaging said bracket to apply downward pressure on said bracket against a spring mounted on said post under said bracket, said bracket including a vertical portion with spaced rivets projecting therefrom through said slot, said bracket also including an integral horizontal portion upon which is mounted a sliding support for said lever, in combination with means for adjusting said support mounted on said horizontal portion, wherein said post is vertically pivotable about said table.

4,405,004
DOVETAIL FIXTURE
William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.
Filed Aug. 17, 1981, Ser. No. 293,430
Int. Cl.³ B27F *1/14*
U.S. Cl. 144—87 **2 Claims**



1. Dovetail fixture for guiding a cutting tool in cutting mortises and tenons, comprising a molded base of one-piece unitary construction equipped with a horizontal table defining a first work receiving surface and a generally vertical apron sloped to provide draft for easy removal from a mold and carrying a series of narrow, vertically oriented bosses having flat faces orthogonal to said first work receiving surface defining a second work receiving surface adapted to support a pair of work pieces in orthogonal abutting relation, a first clamping means adapted to clamp one work piece against said first work receiving surface, a second clamping means adapted to clamp the other work piece against said second work receiving surface, a cutter guiding template having at least one of its edges formed with a series of alternating guide fingers and slots, the template being adapted to overlie one of the work pieces and to be clamped thereupon in a position such that the outer edges of said set of slots and fingers is in alignment with the outer surface of the work piece.

4,405,005
FIREWOOD SPLITTER
Dieter S. Zanker, 602 Esquimalt Rd., Victoria, British Columbia, Canada (V9A 3L4)
Filed May 5, 1981, Ser. No. 260,736
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 C **10 Claims**

1. An apparatus for splitting material such as firewood, comprising:

an elongate metal bar with a top end and a bottom end;

a wedge-shape splitting tip connected to the bottom end of the bar;

a metal slide hammer having an elongate sleeve slidably received over the bar between the top end and the splitting tip, the sleeve having a top end, and a separate solid core having a bottom end for impacting the top end of the

elongate bar, the core being fixedly connected to the sleeve by connecting means spaced apart from the bottom end, the core being of a softer metal than the top end of the bar.

4,405,006

ANTI-SKIDDING DEVICE FOR TIRED, PARTICULARLY PNEUMATIC-TIRED VEHICLE WHEELS ON ICE AND SNOW

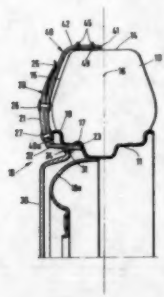
Werner Preusker, Atzelgift, Fed. Rep. of Germany, assignor to Firma Niveau AG, Basel, Switzerland

Filed Dec. 28, 1981, Ser. No. 334,657

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100325; Nov. 14, 1981, 3145250; Dec. 4, 1981, 3148112

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—170 **32 Claims**



1. Anti-skidding device for tires, particularly for pneumatic tire vehicle wheels when used in ice and snow, arranged to be mounted on a motor vehicle wheel, including a base disk arranged to be positioned opposite the motor vehicle wheel, anti-skidding arms arranged to extend radially outwardly of said base disk, in the operating position said anti-skidding arms having radially inner first ends and radially outer second ends and said second ends arranged to be positioned between the tire tread and the surface over which the tire travels, and means for securing said base disk on the motor vehicle wheel, wherein the improvement comprises an annular cover disk arranged to be positioned opposite the side wall of a tire mounted on the motor vehicle wheel, said base disk spaced radially inwardly of said cover disk and arranged to attach said cover disk to the rim of the motor vehicle wheel, said first ends of said anti-skidding arms attached to said cover disk and said second ends of said anti-skidding arms spaced radially outwardly from said cover disk, said anti-skidding arms bent angularly at the second ends thereof relative to said cover disk and arranged in the operating position to remain in position between the tire tread and the surface on which the tire travels.

4,405,007

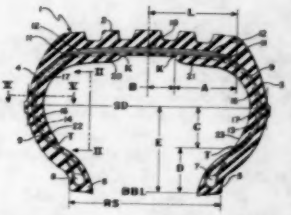
PNEUMATIC SAFETY TIRE

Thomas N. H. Welter, Keispelt, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 27, 1977, Ser. No. 810,658

Int. Cl.³ B60C *17/00*

U.S. Cl. 152—353 R **55 Claims**



1. A safety pneumatic tire for a passenger vehicle: comprising a circumferentially extending ground-engaging tread portion, a pair of sidewall portions, a pair of shoulder portions, a pair of bead portions, a carcass ply structure which extends from said bead portion to said bead portion, said carcass ply structure having at least one layer of parallel reinforcing cords, said tire characterized in that the internal sidewall surfaces are provided with a reinforcing means which extends circumferentially about said tire and uninterrupted along the internal surface of the tire from a point radially below the maximum section width of said tire to a point beneath said tread portion, said reinforcing means terminating prior to reaching the mid-circumferential plane of the tire, the surface of said reinforcing means facing the tire cavity having generally a corrugated cross-sectional configuration, as viewed in a plane perpendicular to the tire surface and radial plane of said tire, said corrugations lying in a plane substantially perpendicular to the mid-circumferential plane of the tire, the thickness of said corrugations being greater than the thickness of said sidewall of said tire measured at the maximum section width of said tire exclusive of adornment of other indicia, the distance between center lines of adjacent corrugations divided by the thickness of said corrugations being at least equal to two but less than or equal to five, said reinforcing means being made from a rubber compound having a Shore A hardness ranging from 70 to 85 and having a modulus greater than 45 Kp/cm^2.

4,405,008

ADJUSTABLE HEAT SHIELD

Robert L. Hazlett, Tucson, Ariz., assignor to Effie Hoopman Hazlett, Tucson, Ariz.

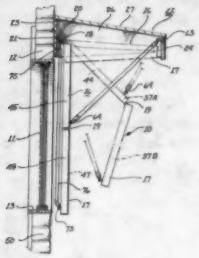
Filed May 22, 1978, Ser. No. 907,644

Int. Cl.³ E05D *15/00*

U.S. Cl. 160—213 **6 Claims**

1. A heat shield mounted to a structure for controlling the flow of heat to and from a desired structural area associated therewith, said shield comprising: an elongated substantially rigid rectangular body portion formed of a light weight heat-insulative material; a snubber bar mounted horizontally on the

associated structure in fixed operative relationship adjacent to and superposed with the desired structural area in substantially parallel relationship to the uppermost edge of said body portion; a unitary flexible skin member integrally formed upon said body portion in total enveloping relationship therewith and having a flap portion extending upwardly therefrom at the uppermost edge of said body portion, said extending flap portion being wrapped about said snubber bar and cooperating therewith to provide said body portion a fixed horizontal axis for selective movement thereabout; and actuating means operatively connected to said body portion and selectively actuatable to move or hold said body portion relative to said snubber bar axis and control the flow of heat to and from said desired structural area

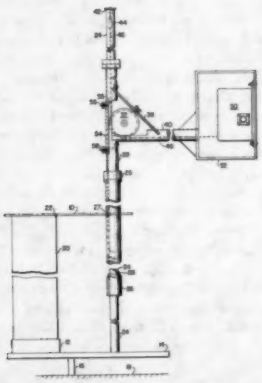


4,405,009

METHOD AND APPARATUS FOR MEASURING INGOT PRODUCTION

Warren J. Nelson, Hanover County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jun. 19, 1981, Ser. No. 275,320
Int. Cl.³ B22D *11/16, 11/124*
U.S. Cl. 164—413 **4 Claims**



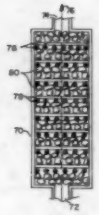
1. In an apparatus for forming a metallic ingot comprising a top mold, a hydraulically driven table and at least one stool carried by said table upon which said ingot is formed, the improvement comprising means for measuring the velocity and displacement of said table, said measuring means comprising a first tube fixedly mounted to and passing through said top mold, a second tube passing through said first tube and constructed and arranged to move with said table, a transducer, said transducer including an extendable and retractable cable as a portion thereof, said cable being connected to said second tube above said top mold, and means for fixedly mounting said transducer with respect to said second tube.

4,405,010

SENSIBLE HEAT STORAGE UNIT

Jacob Schwartz, Arlington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 918,889, Jun. 28, 1978, abandoned.
This application Jun. 9, 1980, Ser. No. 157,930
Int. Cl.³ F28D *17/00*
U.S. Cl. 165—4 **5 Claims**



1. A step function thermal gradient sensible heat storage unit comprising:

a housing having an inlet and an outlet and a flow path therethrough from said inlet to said outlet;

a first plurality of structures permitting fluid flow therethrough disposed within said housing, said structures being spaced apart along substantially the entire length of said flow path;

a second plurality of structures permitting fluid flow therethrough disposed within said housing in between said first plurality of structures, said second plurality of structures providing the principal heat storage medium for the unit;

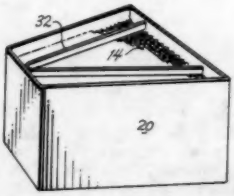
said first plurality of structures providing a substantially straight-line shunt between the sides of said housing and thereby yielding a substantially higher net thermal conduction transverse to said flow path throughout substantially the entire housing than the thermal conductivity of said second plurality of structures such that a step function thermal gradient is provided which permits discharge of the storage unit at a substantially constant output temperature.

4,405,011

ELEMENT BASKET

Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,554
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—10 **4 Claims**



1. An element pack for a regenerative heat exchanger including a plurality of element sheets lying in lateral juxtaposition and spaced apart to permit the flow of fluid therethrough, an open ended basket enclosing the element sheets, said open ended basket including a pair of parallel walls lying parallel to

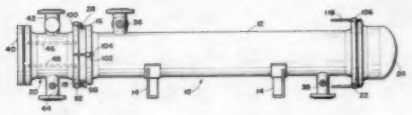
the element sheets and spaced apart to bracket the element sheets therebetween, and an element support means lying at opposite ends of the element basket adapted to hold the element sheets firmly in the basket, said support means comprising a flexible bar having a curved portion forming a variable bight at an end of plural straight portions and disposed such that the curved portion abuts one wall of said pair of parallel walls and the straight portions extend obliquely across an end of the element basket to abut the opposite wall of said pair of parallel walls thereby supporting the element sheets within the basket.

4,405,012

DEVICE TO POSITION COMPONENTS OF SHELL AND TUBE HEAT EXCHANGER

Joe A. Mach, Rte. 1, Box 133, Talala, Okla. 74080

Filed May 26, 1981, Ser. No. 267,003
Int. Cl.³ F28F 7/00
U.S. Cl. 165—78 **4 Claims**



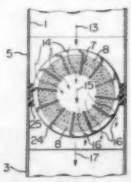
1. Means for facilitating the relative operable radial orientation of the components of a shell and tube type heat exchanger during the assembly thereof and comprising guide pin means provided on selected components of the heat exchanger in preselected positions thereon, and complementary sleeve means provided on mating components of the heat exchanger for slidably receiving the guide pin means therein for assuring proper rotational and axial alignment orientation between the mating components.

4,405,013

ROTARY TYPE HEAT PIPE HEAT EXCHANGER

Eiji Okamoto, Kobe, Japan, assignor to Gadelius K.K., Tokyo, Japan

PCT No. PCT/JP80/00005, § 371 Date Sep. 10, 1980, § 102(e) Date Sep. 9, 1980, PCT Pub. No. WO80/01510, PCT Pub. Date Jul. 24, 1980
PCT Filed Jan. 10, 1980, Ser. No. 209,102
Claims priority, application Japan, Jan. 10, 1979, 54-745
Int. Cl.³ F28D 15/00
U.S. Cl. 165—86 **4 Claims**



1. A heat pipe heat exchanger including first flow path means along which a first fluid of relatively high temperature flows, second flow path means along which a second fluid of relatively low temperature flows, and a plurality of heat pipes disposed across and through said two flow paths so that heat is transferred from said first fluid to said second fluid, characterized in that said heat exchanger includes

a rotor formed by said plurality of heat pipes disposed with such intervals that said first and second fluids can pass therebetween,

said rotor includes separating means fixed to said rotor and separating said first flow path means from said second flow path means, and

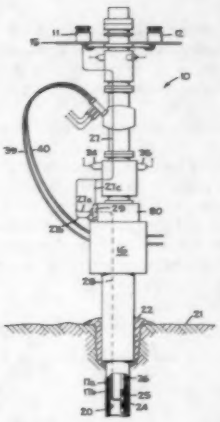
said rotor has means for rotating said rotor so that said heat pipes are rotated temporally by 180° from a low temperature region to a high temperature region for drying materials accumulated on the rotor in order that the dried materials may then, successively be blown off of said rotor by blowing means.

4,405,014

SAFETY VALVE MANIFOLD SYSTEM

Larry J. Talafuse, Spring, Tex., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 139,502, Apr. 11, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 353,111
Int. Cl.³ E21B 7/12
U.S. Cl. 166—72 **14 Claims**



1. A hydraulic valve operating system for opening and closing a surface-controlled, sub-surface safety valve, said system connected for use with a source of pressurized hydraulic fluid and a surface-controlled, sub-surface safety valve mounted in a petroleum well having a wall, said safety valve including a valve actuator having an inlet port, said well including a block valve mounted to a Christmas tree atop said well to connect the safety valve actuator to an outside hydraulic pressure source and to a pressure sink while isolating the safety valve from the outside environment by preventing fluids from being discharged to the outside environment, said system comprising:

a normally closed block valve housing an inlet port and an outlet port;

a fluid accumulator having a variable volume fluid chamber and an inlet port connected to said fluid chamber;

means for decreasing the volume of said accumulator fluid chamber in response to an increase in hydraulic fluid pressure;

means for connecting said block valve outlet port and said accumulator inlet port to said safety valve actuator inlet port while preventing fluid flow to the outside environment;

means for selectively connecting said block valve inlet port and said accumulator volume varying means to said hydraulic pressure source;

means for opening said block valve when said block valve inlet port is connected to said hydraulic pressure source; and

means for selectively connecting said block valve inlet port and said accumulator volume varying means to said pressure sink.

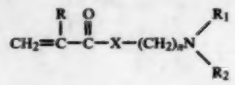
4,405,015

DEMULSIFICATION OF BITUMEN EMULSIONS

David R. McCoy; Edward E. McEntire, and Robert M. Gipson, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,461
Int. Cl.³ E21B 43/24, 43/40
U.S. Cl. 166—267 10 Claims

1. A process for recovering petroleum from oil-in-water bitumen emulsions by demulsifying said emulsions by adding thereto demulsifiers comprising hompolymers or co-polymers of greater than about 2,000 molecular weight of monomers having the general structure



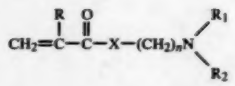
where R=H or lower alkyl, X=NH or 0, n>1, R_1 and R_2 are hydrogen or alkyl wherein the homopolymer and/or co-polymer is in the salt form and monomers of the above structure comprise greater than 50% of the total co-polymer where a co-polymer is used.

10. A process for recovering bitumen from a tar sand formation comprising

injecting into the tar sand a fluid containing hot water and/or steam in order to emulsify the bitumen in the tar sand,

recovering the emulsified bitumen,

demulsifying said emulsions by adding thereto demulsifiers comprising homopolymers or co-polymers of greater than about 2,000 molecular weight of monomers having the general structure



where R=H or lower alkyl, X=NH or 0, n>1, R_1 and R_2 are hydrogen or alkyl wherein the homopolymer and/or co-polymer is in the salt form and monomers of the above structure comprise greater than 50% of the total co-polymer where a co-polymer is used,

converting the salts of the polymers or co-polymers into inactive polymers or co-polymers by pH adjustment of the aqueous phase of the broken emulsion, and

reinjecting the aqueous phase into a bitumen containing formation to recover additional bitumen.

4,405,016

UNDERWATER CHRISTMAS TREE CAP AND LOCKDOWN APPARATUS

Michael J. A. Best, Dursley, England, assignor to Smith International, Inc., Newport Beach, Calif.

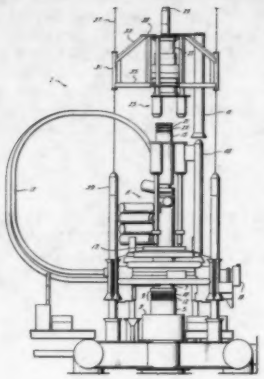
Filed Jun. 29, 1981, Ser. No. 278,359
Claims priority, application United Kingdom, Dec. 18, 1980, 8040496
Int. Cl.³ E21B 41/04, 43/013, 43/017
U.S. Cl. 166—337 28 Claims

1. An apparatus for an actuator which actuates a connector for connecting one end of a tubular member to an underwater wellhead, comprising:

mechanical means for mechanically maintaining the actuator in the actuated position to insure the connection of the tubular member to the wellhead,

said mechanical means including extension means for extending into engagement with said actuator to prevent said actuator from moving to a nonactuated position,

said extension means including a piston slidably disposed within a cylinder and activation means for extending said piston from said cylinder whereby said piston engages the



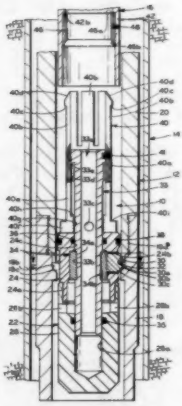
actuator preventing the actuator from moving to a nonactuated position.

4,405,017

POSITIVE LOCATING EXPENDABLE PLUG

Richard G. Allen, Houston, and Mark C. Glaser, Bellaire, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 308,688
Int. Cl.³ E21B 23/03
U.S. Cl. 166—382 26 Claims



9. An expendable tool assembly adapted to be secured within the central bore of a tubular member in a subterranean well and then expended downwardly into the lower portions of the well comprising: a hollow tool body freely insertable in the central bore of the tubular member and defining a vertical bore; radially shiftable locking means mounted on said hollow tool body and engagable with the tubular member preventing vertical movement of said tool body within the tubular member; a mandrel vertically slidable within said vertical bore; said mandrel being shiftable downwardly from a first position in engagement with said locking means to maintain said locking means in engagement with the tubular member, to a second position wherein said radially shiftable locking means may move out of engagement with the tubular member to expend said tool body; sleeve means including a shearable element for

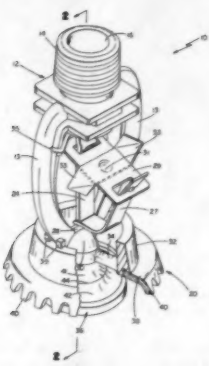
securing said mandrel to said sleeve means, and means on said sleeve means for connection to the bottom end of a control element whereby upward movement of the control element effects shearing of said shearable element with subsequent downward movement of said control element shifting said mandrel to said second position releasing said tool body.

4,405,018

DEFLECTOR WITH SURFACE FOR CIRCUMFERENTIALLY REDISTRIBUTING FLUID FOR IMPROVED SPRAY UNIFORMITY

Michael A. Fischer, North Kingstown, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Providence, R.I.

Filed Jun. 24, 1981, Ser. No. 278,439
Int. Cl.³ A62C 37/08
U.S. Cl. 169—37 **4 Claims**



1. In a fire-protection sprinkler head of the pendent type, said head including a body with means for connecting said head to a supply of fire-retardant fluid, a passage through said body for said fluid, a closure for said passage, means for opening said closure in response to a fire, and a spray-forming deflector means supported below said passage by a dependent structure that extends from said body, said deflector means positioned in the path of fluid emerging from said passage, the improvement wherein said deflector means includes:

a first deflecting surface directly in the path of said emerging fluid and facing generally upward,

said first deflecting surface including a portion shaped to circumferentially redistribute fluid to improve uniformity of distribution and deflect at least some of said fluid generally outward; and

a second deflecting surface positioned outward and away from said first deflecting surface to receive and control the distribution of a portion of the fluid moving outwardly from said first deflecting surface,

said second deflecting surface having an interior opening and being so positioned that the path of the fluid from said passage to said first deflecting surface passes through said opening, and

the flow paths between said first deflecting surface and said second deflecting surface being circumferentially unobstructed so that the circumferential distribution of said fluid leaving said first deflecting surface is not divided as it moves between said first deflecting surface and said second deflecting surface,

wherein said first deflecting surface has an outer circular portion having a vertical cross-section of upwardly concave form defining a first concave surface, and

wherein said first deflecting surface includes a second concave circular surface radially inside of and above said first concave circular surface,

said first and second concave surfaces are joined at a circular ridge, and

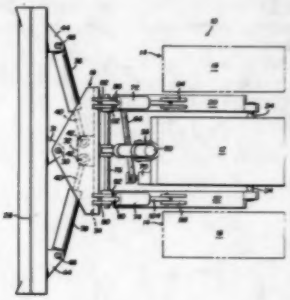
the location of said ridge and the shape of said second concave surface are selected to influence the radial distribution of fluid in the spray pattern generated by said sprinkler head.

4,405,019

ADJUSTMENT AND STABILIZER MECHANISM FOR DOZER BLADE

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 4, 1981, Ser. No. 299,358
Int. Cl.³ E02F 3/76
U.S. Cl. 172—816 **5 Claims**



1. In an earth-working machine having a frame, a pair of push arms pivotally secured at one of their ends to said frame, and a blade pivotally secured to the push arms at their other ends, a pair of lift cylinders pivotally interconnected between said frame and said blade, the improvement comprising:

a pitch-tilt control assembly for said blade including a pitch piston cylinder, a pitch-tilt piston cylinder, a torsion bar, and a pair of drag link connections, means for mounting said torsion bar to the backside of said blade, said torsion bar extending generally parallel to the backside of said blade and being rotatable about its longitudinal axis, said pitch piston cylinder being pivotally attached at one end to said torsion bar and pivotally attached at its opposite end to one of said push arms, said pitch-tilt piston cylinder being pivotally attached at one end to said torsion bar and pivotally attached at its other end to the other of said push arms, said pitch piston cylinder and said pitch-tilt piston cylinder being additionally pivotally attached to said torsion bar by said drag link connections whereby a load on one side of said blade being transmitted to the opposite side of said blade by said torsion bar and drag link connections for counteracting uneven loads on said blade and preventing said blade from following a path of least resistance when uneven loads are applied to said blade.

4,405,020

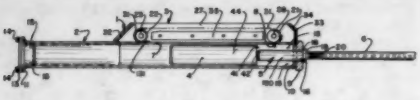
AUTOMATIC DRIVE HAMMER SYSTEM

Charles L. Rassieur, Creve Coeur, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Jul. 15, 1981, Ser. No. 283,490
Int. Cl.³ B25D 9/00
U.S. Cl. 173—89 **12 Claims**

1. In an automatic drive hammer system wherein a hammer is mounted in a tubular housing and mechanism, mounted with said housing, is provided for lifting said hammer a predetermined distance and allowing it to fall free in said housing, the improvement comprising carriage means for carrying said housing and lifting mechanism and means for mounting said carriage on a drill rod feed mechanism support structure of a drill rig drive having a drill rod fed along a vertical axis, said

support structure including a vertical member offset laterally from and parallel to the axis of said drill rod feed, and said means for mounting said carriage on said drill rig drive including means for mounting said carriage on said vertical member rotatably and slidably for swinging movement between an on-hole, operating, position and an off-hole, stored, position.



4,405,021

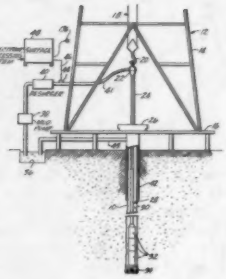
APPARATUS FOR WELL LOGGING WHILE DRILLING

Edward S. Mumby, Carmichael, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.

Continuation-in-part of Ser. No. 211,501, Nov. 28, 1980, abandoned, which is a continuation of Ser. No. 21,348, Mar. 19, 1979, abandoned. This application Sep. 15, 1981, Ser. No. 302,446

Int. Cl.³ E21B *47/00*

U.S. Cl. 175—48 29 Claims



1. In apparatus for sending information to a surface fluid-pulse detector through a drilling fluid in a borehole drilled in the earth with a drill bit on the lower end of a drill string in the borehole and through which the drilling fluid is circulated with a pump to flow through the interior of the drill string, past the drill bit, and into an annulus between the drill string and the borehole wall, the improvement comprising:

(a) means defining a passage for drilling fluid between the drill string interior and the annulus to bypass the drill bit;

(b) a valve disposed in the passage to be held in a normally closed position by the difference in drilling fluid pressure cross the valve,

(c) the valve including:

(i) a valve housing with an inlet and an outlet;

(ii) a valve seat in the housing between the inlet and the outlet;

(iii) a valve disk disposed in the housing on the inlet side of the seat so the disk is urged against the seat by fluid pressure difference between the valve inlet and outlet, the disk being shaped to rest on the seat and close the valve by sealing the valve inlet from the outlet;

(iv) a valve guide chamber in the housing on the inlet side of the seat;

(v) a piston secured to move with the disk and disposed to slide in the chamber;

(vi) means connecting the chamber interior with the fluid on the outlet side of the seat when the valve is closed; and

(vii) means on the valve disk for urging the valve toward a closed position when fluid passes through it so the fluid exerts a net force on the valve disk in the direction of the seat;

(d) means for applying an opening force to open the valve so drilling fluid flows through it; and

(e) means for removing the force on the valve so it moves to the closed position, the opening and the closing of the valve generating a pressure pulse in the drilling fluid.

4,405,022

TUBULAR HANDLING SYSTEM FOR OIL DRILLING RIGS

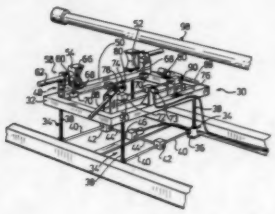
Brian C. Will, Calgary, Canada, assignor to Slant Drilling Systems Ltd., Calgary, Canada

Filed Oct. 13, 1981, Ser. No. 310,548

Claims priority, application Canada, Jun. 3, 1981, 378932

Int. Cl.³ E21B *19/20*

U.S. Cl. 175—85 16 Claims



1. Drilling apparatus comprising an inclined mast, drive means slidably mounted on the mast for rotating a tubular drilling member, and at least two positioning units secured to the mast at spaced positions therealong for positioning tubular drilling members, each positioning unit comprising a frame, means for raising the frame a preset distance above the mast and lowering the frame from the preset distance, gripper means adjacent opposite sides of the frame, means for raising the gripper means a preset distance above the frame and lowering the gripper means from the preset distance, means for moving the gripper means towards one another to grip a tubular drilling member therebetween and for moving the gripper means away from one another to release the tubular drilling member, locating means adjacent opposite sides of the frame, and means for raising the locating means to cause said locating means to engage and position lower parts of the tubular member, with the tubular member being movable away from the mast out of contact with the locating means without moving the locating means, said drive means being movable along the mast past at least one positioning unit.

4,405,023

APPARATUS FOR HANDLING AND WEIGHING FRUITS AND THE LIKE

Agustin D. Guardiola, Camelia 36, Barcelona, Spain

Filed Feb. 22, 1982, Ser. No. 350,834

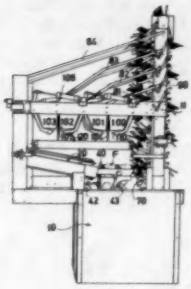
Claims priority, application Spain, Mar. 6, 1981, 500,951

Int. Cl.³ G01G *19/22*

U.S. Cl. 177—59 11 Claims

1. Improvements in automatic weighing machines for fruits and the like, comprising a feed entry having various channels terminating in means for retaining the product to be weighed and allowing it to rest there, followed by horizontal transport means arranged in sets in which each set corresponds to one of said channels, the said sets being out of phase with each other as regards their motion and carrying the corresponding product from the respective retention means to a weighing means assigned to each set and, following this, from said weighing means to vertical transport means which are also constituted by the same number of sets and channels and which carry the product which has already been weighed, to a number of ramps which are super-posed at differing heights, which discharge into respective storage areas provided with means for

discharging their content, a further ramp located above those referred to previously, being provided for leading the rejected product (as a result of it having an inadequate weight) towards the entry into the machine, the vertical transport means having



selector means which allow the product to be discharged on to the corresponding ramp, horizontal and transverse transport means being provided below said storage areas for carrying away the product in batches of predetermined and adjustable weight.

4,405,024

WEIGHING DEVICES

Robert H. Fraval, Langley, and Howerd P. Oakford, Byfleet, both of England, assignors to National Research Development Corporation, London, England

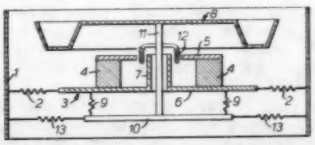
PCT No. PCT/GB80/00212, § 371 Date Aug. 7, 1981, § 102(e) Date Aug. 7, 1981, PCT Pub. No. WO81/01742, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 8, 1980, Ser. No. 293,631

Claims priority, application United Kingdom, Dec. 8, 1979, 7942430

Int. Cl.³ G01G *19/00, 3/14*

U.S. Cl. 177—200 **10 Claims**



1. A device for weighing a load of unknown mass comprising a first body (**3**; **23**; **68**) of known mass, a second body (**8**; **28**; **66**) of known mass adapted to carry a load of unknown mass, a base (**1**; **21**; **60**, **62**), a suspension system in the form of matching spring means (**2**, **13**; **22**, **33**; **65**, **67**) for each body supporting the bodies on the base for substantially unimpeded motion in one mode over at least a limited distance, and further spring means (**9**; **29**; **83**) connecting said bodies so that their natural oscillations are in said one mode and mutually opposed, whereby opposite forces are transmitted via the spring suspension means to the base and the bodies are substantially isolated from the environment, and means (**12**; **32**; **76**) for determining the resonant frequency of such oscillations and hence the mass of the load.

4,405,025

ELECTRONIC WEIGHING APPARATUS OF INDUCTION TYPE

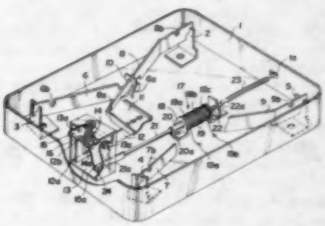
Shuichi Yanagita; Tsutomu Miyoshi, and Masashi Miyane, all of Tokyo, Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,623

Claims priority, application Japan, Jun. 15, 1981, 56/90833

Int. Cl.³ G01G *3/14, 21/08*

U.S. Cl. 177—210 FP **14 Claims**



1. An electronic weighing apparatus of the induction type comprises a weighing member adapted to be moved according to the weight of a load to be measured, a variable inductance element consisting of a coil and a magnetic core which is movable relative to said coil and through said coil, means for connecting said weighing member with one of said coil and said magnetic core of said inductance element so that said one can be moved with respect to the other according to the movement of said weighing member and thus the inductance of said inductance element can be changed proportionally to the movement of said weighing member, a sensor oscillator for generating at an output a series of pulses having a period representative of the inductance of said variable inductance element, means connected to receive said pulses and arranged for converting said period of said output pulses from said sensor oscillator into a weight signal indicative of the weight of said load, a display for receiving said weight signal from said converting means and providing an indication of the weight of said load, said sensor oscillator comprising a comparator having an inverting input terminal, a non-inverting input terminal and an output terminal and an integrator having an inverting input terminal, a non-inverting input terminal and an output terminal, said coil of said variable inductance element being connected between said output terminal of said comparator and said non-inverting input terminal of said intergrator, and said output terminal of said comparator being connected to the output of said sensor oscillator.

4,405,026

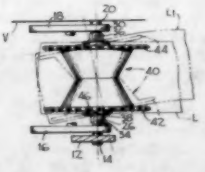
MOUNTING MECHANISM FOR ENDLESS TRACTION BAND SYSTEM

Donald V. Merrifield, Huntsville, Ala., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1980, Ser. No. 202,065

Int. Cl.³ B62D *55/08, 55/14*

U.S. Cl. 180—9.62 **10 Claims**



1. In vehicle traction apparatus of the type including an endless traction band having an outer convex surface and an

inner concave surface, a first roller chain mounted on one side edge of the band and a second roller chain mounted on the other side edge of the band, said roller chains being of the type that can experience a deviation of up to about +6° from a linear path, an improved mounting mechanism for the endless band comprising first and second spaced apart arms each having an upper end and a lower end, means for mounting the upper ends of said arms to said vehicle so that said arms depend from said vehicle in parallel spaced apart relation, said mounting means affording independent pivotal movement of said arms about a generally horizontal common axis that extends substantially transversely of the vehicle, first and second shaft supports carried at the lower ends of respective said arms, there being imaginary lines extending between respective said mounting means and said shaft supports, said shaft supports each including a body portion and means for securing said body portion to said lower end for pivotal movement about a gimbal axis that is substantially parallel to said imaginary line, and an endless band support member including a shaft mounted to said body portions for rotation relative thereto and extending between said arms, first and second sprockets fixed to said shaft for engaging respective said roller chains, said support member skewing by an amount corresponding to said deviation between a position parallel to said common axis and a position oblique of said common axis in response to side loads imposed on said endless band so as to maintain substantial parallelism between said sprockets and said roller chains.

4,405,027

MOTOR VEHICLE

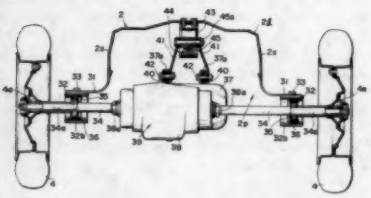
Akito Enokimoto, Asaka; Toshio Tsuchiya, Kawagoe; Tatsuo Masuda, Niiza, and Suwaji Takano, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 84,175, Oct. 12, 1979, abandoned. This application Oct. 14, 1981, Ser. No. 311,467

Claims priority, application Japan, Oct. 12, 1979, 54-125619

Int. Cl.³ B60K *5/12*

U.S. Cl. 180—56 **7 Claims**



1. A motor vehicle, comprising:

a vehicle frame;

a seat for a driver of said vehicle;

rear wheels, and axles therefor;

two leaf springs extending rearwardly from both sides of said vehicle frame, below said seat, such that said leaf springs support said axles of said rear wheels at the rear ends of said leaf springs;

each of said leaf springs being formed at the rear end thereof with a bearing portion for mounting said axles;

an elastic member being sandwiched between said bearing portion and the bearing of each rear axle such that said axles are mounted elastically on said rear ends of said leaf springs;

a power unit including an engine and a transmission case disposed between said leaf springs, in a space defined under said frame below said seat;

an engine mounting member depending downwardly from a portion of said frame disposed above said engine;

a pair of transversely spaced suspension members connected to said engine so as to extend upwardly therefrom, said suspension members being in turn connected to said engine mounting member;

said suspension members being elastically connected to said engine at transversely spaced portions thereof to define two elastic support portions for said engine, and being elastically connected to said engine mounting member to define a third elastic support portion for said engine; and

said axles of said rear wheels having the inner ends thereof rigidly supported by, and extending from opposite sides of, said transmission case such that the axes of said axles are incapable of displacement relative to each other.

4,405,028

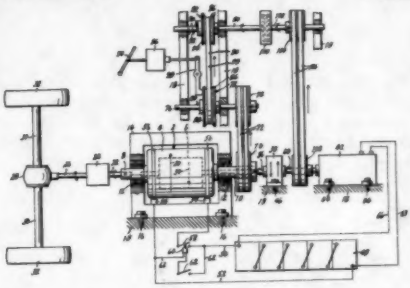
DRIVE SYSTEM FOR ELECTRIC VEHICLES

Cosby G. Price, 6403 N. Walrond, Gladstone, Mo. 64119

Filed Jun. 18, 1981, Ser. No. 275,113

Int. Cl.³ B60K *1/00*

U.S. Cl. 180—65 E **3 Claims**



1. A drive system for an electric vehicle having a frame and ground-engaging drive wheels, said drive system comprising:

a. an electric motor the main elements of which consist of a case carrying the field windings of the motor and being rotatably mounted on the frame of said vehicle, and an armature carrying the armature windings of the motor and being rotatable in said case coaxially therewith, whereby when electric power is supplied to said motor said case and armature will rotate in opposite directions, each being driven by the reactive force of the other,

b. rechargeable electric storage batteries operable to supply electric power to said motor,

c. a first drive train operably connecting one of said main motor elements to said vehicle drive wheels, whereby the latter are driven by the former to propel said vehicle, the torque delivered to said power train by said motor being variable directly with the differential between the rotational speeds of said motor elements,

d. an electric generator,

e. a drive connection between the other of said main motor elements and said electric generator, whereby the latter is driven by the former, the electric output of said generator being connected in recharging relation to said storage batteries,

f. a second drive train interconnecting the main motor element which is connected to said vehicle drive wheels by said first-named drive train to the input of said generator, whereby the latter may be driven by the former, in the same direction it is driven by the other of said motor elements, and

g. a uni-directional clutch interposed in said second drive train and operable to prevent said generator from driving the motor element to which it is connected by said second drive train by reverse operation of said drive train, whereby as the vehicle speed reaches or exceeds a predetermined equilibrium level at which the speed of said wheel-drive motor element equals or exceeds the speed at

which the generator is driven by the other motor element, said clutch will engage to drive said generator, thereby locking said motor elements at a fixed differential speed of rotation, which deprives the motor of the ability to generate the additional motive power which would be required to drive the vehicle at any speed higher than said equilibrium level.

4,405,029

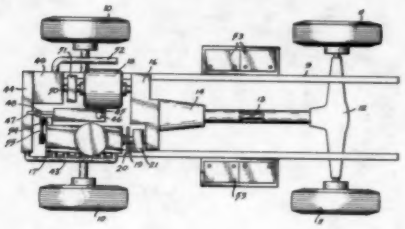
HYBRID VEHICLES

Hugh S. Hunt, 12219 River Rd., Potomac, Md. 20854

Continuation-in-part of Ser. No. 108,987, Jan. 2, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 322,050

Int. Cl.³ B60K *25/00*

U.S. Cl. 180—65 A **5 Claims**



1. A hybrid vehicle comprising a frame supported by ground engaging wheels, propelling means including a transmission and drive shaft for driving certain of said wheels, an electric motor mounted on said frame, means for selectively connecting said electric motor to said propelling means, said means for connecting said electric motor to said propelling means for the vehicle including a transfer case having a power shaft connected to said transmission, an internal combustion engine mounted on said frame, means for selectively connecting said internal combustion engine to said power shaft to selectively drive said propelling means, said transfer case further including bypass means operably connecting said internal combustion engine to drive said electric motor to generate electricity while simultaneously disconnecting said internal combustion engine and said electric motor from said propelling means, said internal combustion engine having an exhaust manifold for removing heated exhaust gases therefrom, chamber means communicating with said exhaust manifold for receiving said exhaust gases therefrom, energy conversion means for utilizing the energy of said heated exhaust gases within said chamber means to generate an output which is connected to selectively drive said electric motor, means for electrically connecting said electric motor to at least one storage battery for receiving and storing electrical energy being generated by said electric motor, said storage battery being electrically connected to said electric motor to selectively drive said electric motor when said electric motor is connected to said propelling means, whereby either said internal combustion engine or said electric motor may be selectively operated to propel the vehicle and wherein the storage battery may be charged during operation of the internal combustion engine through the use of the exhaust gases.

4,405,030

STEERING SYSTEM AND COMPENSATING VALVE

Richard A. Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 16, 1981, Ser. No. 244,396

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—153 **9 Claims**

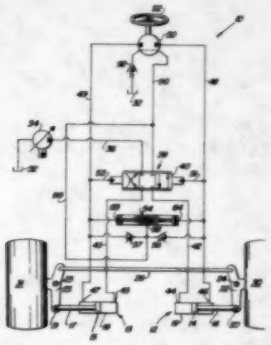
1. A steering system for a vehicle having a pair of steerable wheels attached to pivotable support arms and joined together by a mechanical link, said system comprising:

(a) first and second steering cylinders each having a piston with an attached piston rod extending through one end thereof and each cylinder having a head chamber and a feedback chamber;

(b) a fluid reservoir;

(c) a supply pump connected to said reservoir for supplying pressurized fluid to said head chambers of said cylinders;

(d) first and second fluid passages connected to said feedback chambers of said first and second cylinders, respectively;



(e) control valve means for selectively controlling the flow of pressurized fluid from said supply pump to said head chambers of said cylinders, said valve means connected across said first and second fluid passages and actuatable by pressure differences therebetween;

(f) a metering pump connected to said first and second passages for facilitating movement of fluid therebetween;

(g) a manually operable steering element connected to said metering pump for controlling the steering of said wheels; and

(h) compensating valve means for regulating fluid pressure across said first and second fluid passages so that a predetermined pressure range is possible between said first and second fluid passage.

4,405,031

METHOD AND DEVICE FOR OPERATING A MOTOR VEHICLE WITH AN INTERNAL-COMBUSTION ENGINE

Gerhard Rotter, Obersasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 143,713, Apr. 25, 1980, abandoned. This application Aug. 10, 1982, Ser. No. 406,898

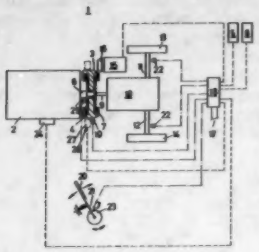
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917139; Apr. 27, 1979, 2917296

Int. Cl.³ B60K *9/04*

U.S. Cl. 180—165 **20 Claims**

1. A method of operating a wheel-mounted motor vehicle wherein a rotary flywheel for minimizing non-uniformity of rotational motion is engageable with and disengageable from the internal combustion engine by a first clutch and such flywheel is engageable with and disengageable from the wheels of the vehicle by a second clutch, comprising the steps of automatically (a) disengaging the second clutch by a shifting and control device when the vehicle is in motion but the engine does not drive the wheels, such as during deceleration, braking or coasting, and maintaining the first clutch in engaged condition while operating the engine at a minimal speed; (b) disengaging the first and second clutches by a shifting and control device when the vehicle is briefly arrested, such as at a traffic

light, so that the flywheel continues to rotate due to inertia, and arresting the engine; and (c) restarting the engine, including engaging the first clutch but maintaining the second clutch in disengaged condition by a shifting and control device.



4,405,032

WHEEL HUB ASSEMBLY

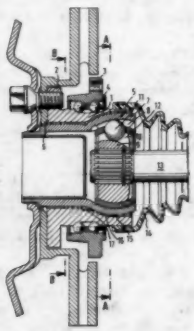
Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach, both of Fed. Rep. of Germany, assignors to Lohr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,500

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017757

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—259 **13 Claims**



1. A wheel hub assembly comprising a tubular shaped hub member having an axis of rotation, bearing means for rotatably supporting said hub member, a universal joint member engageable with said hub member for driving said hub member about the axis of rotation thereof, said universal joint member is positioned within said hub member, said hub member and said universal joint member having confronting surfaces extending in the direction of the axis of rotation of said hub member, said confronting surfaces are spaced radially apart and after said universal joint member is assembled within said hub member a filler material is filled into the space between the confronting surfaces so that it completely fills the space and forms a torque transmitting connection between said universal joint and said hub member.

4,405,033

FAIL-SAFE METHODS FOR GENERATING A PULSE INDICATING THE PRECISE MOMENT OF FIRING OF A GAS EXHAUSTING GUN

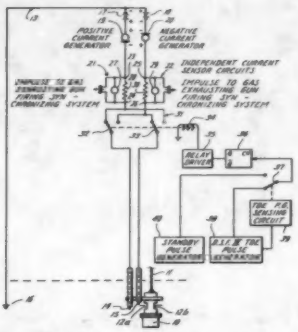
Lloyd E. Elliott, Jr., and John L. Hudson, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 90,158, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 913,772, Jun. 8, 1978, abandoned. This application Jan. 26, 1981, Ser. No. 228,432

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ G01V *1/38, 1/14*

U.S. Cl. 181—120 **14 Claims**


POSITIVE CURRENT GENERATOR
NEGATIVE CURRENT GENERATOR
INDEPENDENT CURRENT SENSOR CIRCUITS
IMPULSE TO GAS EXHAUSTING GUN FIRING SYS. - CHARGING SYSTEM
IMPULSE TO GAS EXHAUSTING GUN FIRING SYS. - CHARGING SYSTEM
RELAY DRIVER
TIME P.G. SPACING CIRCUIT
STANDBY PULSE GENERATOR
P.I.E.M. TRG. PULSE GENERATOR

1. A fail-safe method for detecting firing of a gas exhausting gun having two closely spaced apart electrodes submerged underwater very close to the gas exhausting gun exhaust port comprising,

(a) passing a current to a sea ground as a backup electrode when any one of the two electrodes becomes defective for providing a fail-safe indicator.

4,405,034

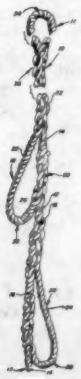
ROPE LADDER

James Dunne, 12518 S. Pawnee Rd., Palos Park, Ill. 60464

Filed Dec. 24, 1981, Ser. No. 334,130

Int. Cl.³ E06C *1/56*

U.S. Cl. 182—190 **4 Claims**



1. A rope ladder comprising,

a main rope piece formed of a twisted, stranded fibrous

material, said main rope piece including a top end and a bottom end,

a plurality of short rope pieces formed from a twisted and stranded fibrous material, each of said short rope pieces including opposed ends,

each of said short rope pieces including one end securely connected to said main rope piece by interweaving the braided and stranded fibrous material forming said short rope piece with the twisted and stranded fibrous material forming said main rope piece, said splicing facing the direction of the top end of said main rope piece, and the opposed end of said short rope piece similarly being securely connected to the main rope piece by splicing the opposed end of the twisted and stranded fibrous material forming said short rope piece with the twisted and stranded material forming said main rope piece, said splicing similarly extending in an upward direction toward the top end of said main rope piece,

each of the plurality of short rope pieces thereby creating a plurality of loops along the length of said main rope piece,

and each of said plurality of loops being sequentially positioned on opposed sides of said main rope piece in alternating fashion along the length thereof, each succeeding loop secured to said main rope piece being 180° out of the plane of the immediately previous vertically positioned loop whereby said loops are positioned in alternating side to side relationship along the entire length of said main rope piece.

4,405,035

METHOD AND APPARATUS FOR INJECTING VISCOUS MATERIALS

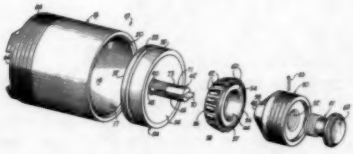
William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Division of Ser. No. 115,062, Jan. 24, 1980. This application Oct. 13, 1981, Ser. No. 310,382

The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.

Int. Cl.³ F01M *11/00*

U.S. Cl. 184—1 D **2 Claims**



1. A method of applying a lubricant to a bearing comprising inserting said bearing into a lubricant chamber to seal an outer peripheral surface of said bearing against a tapered surface of a piston member disposed within said lubricant chamber;

sealing an inner peripheral surface of said bearing with tapered spool member by inserting said tapered spool member within a central aperture in said bearing;

mounting said lubricant chamber between vice jaws of a common vice; and

compressing said vice jaws to force grease through a central opening in said piston member and outwardly into said bearing.

4,405,036

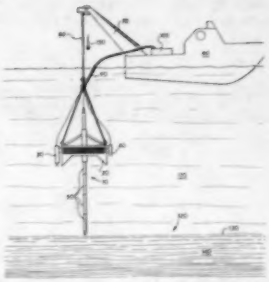
SEAFLOOR VELOCITY AND AMPLITUDE MEASUREMENT APPARATUS METHOD

Kenneth R. Wener, Littleton, Colo.; James F. Huff, Sugar Land, Tex., and Anthony R. Tinkle, Little, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 11, 1980, Ser. No. 215,591

Int. Cl.³ G01V *1/16, 1/38*

U.S. Cl. 181—110 **5 Claims**



1. An apparatus (10) operative with a crane (70) on a vessel (60) on the sea (110) for penetrating the mudline (130) of the sea-floor (120) and for measuring the substantial vertical velocity of the pressure wave (310) from an acoustic pulse (300) through the different layers of sediments (140) located directly below the mudline (130), said apparatus comprising:

a ballast (20) operatively connected to said crane (70),

means (30) located on said ballast (20) for providing said acoustic pulse (300),

a plurality of rigidly interconnected vertical sensors (50) connected to said ballast (20) and extending downwardly therefrom predetermined substantially vertical distances from said providing means (30) for sensing the substantial vertical velocity of said pressure wave (310) at different vertical locations in said sediments,

said ballast (20) having sufficient weight to embed said sensors (50) downwardly into said sediments when lowered by said crane (70) and to place said providing means (30) into a region near said mudline (130) and above said sediments (140) to be measured, each of said sensors (50) being capable of generating an electrical signal (550) in response to said sensed substantial vertical velocity of said pressure wave (310), and

means (100) located on said vessel (60) receptive of said electrical signals (550) from said sensors (50) and based upon the values of the aforesaid predetermined substantially vertical distances for measuring the substantial vertical velocity of said pressure wave (310) through said layers of sediment (140) between said providing means (30) and said sensors (50).

4,405,037

RAIL VEHICLE SLACK ADJUSTER

Lars M. Severinsson, Hishult; Peter Beijbom, Lund, and Anders K. Martensson, Bjärred, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

Filed Jun. 10, 1981, Ser. No. 272,183

Claims priority, application Sweden, Jun. 24, 1980, 8004667

Int. Cl.³ F16D *65/56*

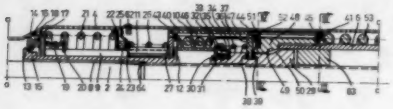
U.S. Cl. 188—196 D **8 Claims**

1. A rail vehicle slack adjuster of the double-acting, clearance-sensing, axial type, comprising

an elongated barrel,

a non-rotatable pull rod extending out of the barrel from one of its ends and intended for brake force introduction into the adjuster,

a non-rotatable threaded spindle extending out of the barrel from its opposite end and intended for brake force transmission from the adjuster,
a leader unit and an adjuster unit cooperating with the spindle in the barrel, and
a barrel spring arranged around the pull rod acting between the adjuster unit and the barrel end,
the leader unit including a leader nut in non-self-locking engagement with the spindle and capable of being clutched to the barrel under the action of a pay-out spring for preventing relative rotation between the leader nut and the barrel under certain conditions, and
the adjuster unit including an adjuster nut in non-self-locking



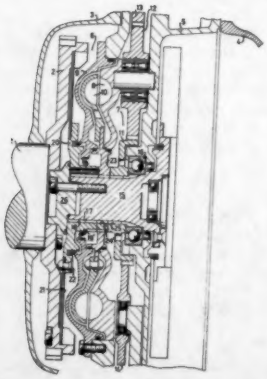
engagement with the spindle and capable of being clutched to a pull sleeve connected to the pull rod for transmitting the pulling brake force to the spindle, characterized in that the adjuster unit includes a sleeve non-rotatingly engaging the barrel acted on by the pulling brake force from the pull rod and the opposite force from the barrel spring and in that the leader nut is provided with telescoping means for sensing elasticity which are only axially movable relative to the leader nut, first clutch means conditionally clutchable to engage the leader nut to the barrel and to thereby said non-rotatable sleeve, and further clutching means enabling the leader nut to rotate with clutch engagement of said first clutch means with the barrel.

4,405,038

DEVICE FOR TROQUE TRANSMISSION BETWEEN A DRIVE SHAFT, E.G. AN ENGINE CRANKSHAFT, AND AN ATTACHMENT UNIT SUCH AS A HYDRODYNAMIC RETARDER

Runo R. O. Ternehäll, Skärhamn, Sweden, assignor to Ab Volvo, Gothenburg, Sweden

Filed Nov. 18, 1980, Ser. No. 208,009
Claims priority, application Sweden, Nov. 19, 1979, 7909554
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 B **5 Claims**



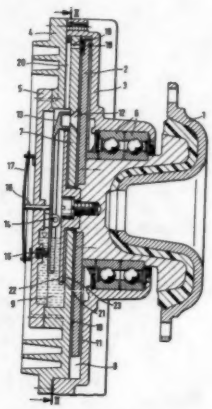
1. A device in motor vehicles for torque transmission between an engine crankshaft and at least one driven unit, said device comprising an extension shaft journalled in bearing means for rotation about an axis of rotation coinciding with the axis of rotation of the crankshaft and having external splines and a tubular connection member having internal splines engaging the external splines of the extension shaft and connected to a fly wheel on the crankshaft by means of an axially flexible member rigidly attached to the fly wheel and to the tubular connection member, the extension shaft end facing the crankshaft and the crankshaft having interengaging means preventing radial but permitting axial movement of the extension shaft in relation to the crankshaft, said driven unit having means which are arranged concentrically with at least one of said extension shaft and said tubular member and have internal splines engaging external splines on one of said extension shafts and said tubular member.

4,405,039

FLUID FRICTION CLUTCH

Kurt Hauser, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 290,058
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3029992
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B **11 Claims**



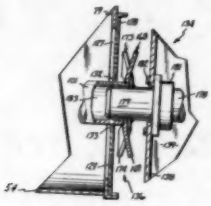
1. A fluid friction clutch, comprising:
a driven disk member;
a drivable housing member surrounding said driven disk member in such a manner as to provide a working chamber therebetween for receiving a fluid capable of transmitting rotational force between said driven disk member and said housing member;
a reservoir separate from said working chamber for containing the fluid;
a selectively openable and closable inlet orifice providing fluid communication between said reservoir and said working chamber;
a return conduit providing fluid communication between said working chamber and said reservoir; and
a supplemental disk member rotatable with said driven disk member and positioned within said reservoir so as to be wetted by the fluid at least when the fluid friction clutch is at rest.

4,405,040

RELEASABLE DRIVE APPARATUS

Floyd E. Buschbom, Long Lake, and Donald L. Henke, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Division of Ser. No. 115,184, Jan. 25, 1980. This application Jun. 2, 1981, Ser. No. 269,634
Int. Cl.³ F16D 11/00, 21/00
U.S. Cl. 192—67 R 11 Claims



1. An apparatus for driving a movable means, said movable means including driven shaft means comprising: power means having drive shaft means for driving the drive shaft means, releasable means drivably connecting the drive shaft of the power means with the driven shaft means whereby the power means rotates the driven shaft means, said releasable means includes first means having at least one first arm secured to the shaft means, and second means having at least one second arm secured to and moved by the drive shaft means to the power means, one of said shaft means having an axial passage having an open end, and the other of said shaft means having projection means adapted to fit into the axial passage through the open end thereof to support said one of said shaft means on the other of said shaft means, said first and second arms being engageable with each other to transmit power from the power means to the driven shaft means when the projection means is located in said axial passage.

4,405,041

CLUTCH RELEASE MECHANISM FOR A PULL TYPE CLUTCH

George T. Broadbent, Chesterfield, England, assignor to Automotive Products Limited, Leamington Spa, England

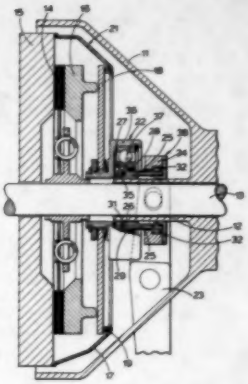
Filed Jul. 16, 1981, Ser. No. 283,873
Claims priority, application United Kingdom, Jul. 22, 1980, 8023908
Int. Cl.³ F16D 23/14
U.S. Cl. 192—98 5 Claims

1. A clutch release mechanism for a pull type friction clutch of a motor vehicle transmission system having a gearbox with a sleeve surrounding the gearbox input shaft and a clutch cover assembly, said mechanism comprising;

a clutch release bearing assembly secured to the clutch cover assembly and having a shoulder thereon;

a clutch release fork pivoted relative to the gearbox housing;

and a coupling means which connects the release fork to the bearing assembly, said coupling means being automatically connectable and disconnectable with the bearing assembly by engagement and disengagement, respectively, with the shoulder on the assembly depending upon the axial position of the sleeve relative to the coupling means, so that said coupling means automatically latches with said shoulder when the gearbox is in its operable position, and is automatically unlatched from said shoulder when the gearbox is withdrawn.

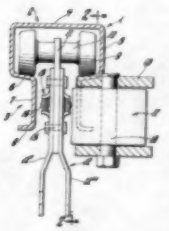


4,405,042

COMBINATION ENCLOSURE/SUPPORT FOR CONVEYOR APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Clarence A. Dehne, Farmington, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Continuation of Ser. No. 83,405, Oct. 10, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,117
Int. Cl.³ B65G 17/38
U.S. Cl. 198—687 2 Claims



1. An overhead power driven conveyor apparatus, comprising:

a plurality of elongated track members longitudinally joined to form a continuous single overhead track supported by a plurality of hanger members at spaced intervals;

a power driven continuous chain member;

a plurality of trolley members, each of said trolley members being operatively connected to said continuous chain member;

each said trolley member including:

a pair of wheels mounted for rotation to opposite ends of an axle member;

load supporting means on said trolley comprising a downwardly depending bracket member supported by said axle member;

a pair of load attachment members extending along one side of said bracket member;

means securing said attachment members to said bracket in depending relationship;

a pair of chain link support portions disposed adjacent the upper portion of each said load attachment member and respectively extending on opposite sides of said load supporting means, each said support portions defining at least a portion of a recess in which a portion of a rigid chain link is received;

said bracket member including:

an upper portion substantially coextensive longitudinally with the portion of said axle between said wheels and receiving and being supported by the latter axle portion;

a depending main body portion;

lower oppositely recessed portions and a lowermost inwardly tapered connection portion;

said attachment members receiving and being connected to said connection portion in load supporting relationship; and

each said attachment member having an outwardly flanged portion forming with said lower recessed portion one of the recesses for receiving a portion of said rigid link: and

each of said elongated track members including:

an upper enclosure defined by a top wall portion, first spaced apart downwardly-depending side wall portions, and a pair of spaced apart lower wall portions extending integrally from and substantially perpendicular to said side wall portions;

said lower wall portions each including an upper surface thereof for supporting and guiding one of said wheels of said trolley member;

a lower chain enclosure extending downwardly from said upper enclosure; and

said lower chain enclosure including a pair of substantially parallel spaced apart second side wall portions which are constructed and arranged not to contact any movable member, each of said second side wall portions extending integrally downwardly from one of said lower wall portions of said upper enclosure a sufficient distance to dispose therebetween and to be spaced apart from said chain link support portions of said trolley member;

said top wall portion of said upper enclosure being substantially horizontal, said first spaced apart side wall portions extending integrally and substantially vertically downwardly from each side of said top wall portions, and said lower wall portions of said upper enclosure extending integrally and substantially horizontally inwardly from said first side wall portions such that the inner ends thereof are spaced apart;

said pair of spaced apart second side wall portions of said lower chain enclosure extending substantially vertically downwardly from the inner ends of said lower wall portions of said upper enclosure; and

said chain link support portions of said trolley member being disposed adjacent to but spaced apart from a central portion of said lower chain enclosure of said track member.

4,405,043

DYNAMICALLY BALANCED VIBRATORY SYSTEM

George L. Burghart, 2993 Curtiss Lot 45B, Des Plaines, Ill. 60018

Filed Jun. 12, 1981, Ser. No. 272,902
Int. Cl.³ B65G *27/24*
U.S. Cl. 198—769 **18 Claims**

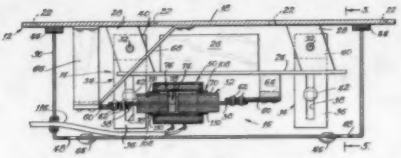
1. A dynamically balanced vibratory feeder system comprising:

a. a material handling component including an elongated platform oriented substantially horizontally and formed to support a material conveying trough,

b. a counterweighting component having a rigid plate oriented substantially horizontally and positioned adjacent to said elongated platform, said counterweighting component including a counterweight secured to said plate and located between said plate and said elongated platform.

c. a plurality of inclined struts resiliently interconnecting said material handling and counterweighting components,

d. driving means comprising an electromagnet driver connected between said material handling and counterweighting components to reciprocally drive said components in opposed relative directions, said driving means including a driving portion and a driven portion, said driving portion being essentially isolated from the reciprocal movement of said material handling and counter-



weighting components and including means resiliently mounting said driving portion on said driven portion, and said driven portion comprising a portion connected to said material handling component and a portion connected to said counterweighting component, and

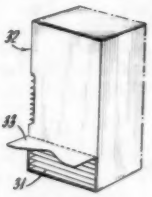
e. means supporting said system upon said struts at a substantially vibrationally neutral location.

4,405,044

DISPENSER BOX FOR PACKAGES OF STERILE SUTURES

David I. Flower, Bridgewater, and Michael Schuler, Edison, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 17, 1981, Ser. No. 303,283
Int. Cl.³ B65D *83/08, 5/72*
U.S. Cl. 206—44.12 **8 Claims**



1. A dispenser for a plurality of packages of sterile suture materials comprising a front panel and a rear panel, a top panel and a bottom panel, and a pair of side panels, an opening disposed at the bottom of the front panel and abutting the bottom panel for removing a single suture package from said dispenser, an area of said front panel adjacent said opening panel being easily deflectable to allow for removal of a plurality of suture packages at one time and viewing means disposed vertically in the front panel to allow for ready determination of the amount of packages of sutures remaining in said dispenser.

4,405,045

AUTOMATIC TWO-COMPONENT MEDICATION TIME-INTERVAL REMINDER CAP AND CONTAINER

Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121

Filed May 1, 1981, Ser. No. 259,664
Int. Cl.³ B65D *83/04*
U.S. Cl. 206—534 **9 Claims**

1. A two-component medicament container comprising:

a cylindrical hollow body closed at one end and open at the opposite end;

a pair of parallel circumferentially extending ridges on the outside circumference of the hollow body, a distance below the open end;

a plurality of hour indicia extending about the circumference of the hollow body below said ridges;

a cap for closing the open end of the hollow body having a top flat portion and a depending circular flange, the diameter of said cap being slightly larger than the diameter of said flange and ridges, a lateral flange on an end of the depending flange, a pair of parallel circumferentially extending grooves on an inside surface of the depending flange coincident with said ridges such that when said cap is telescoped over the open end of the hollow body the ridges snap into the grooves whereby the cap is tightly held onto the hollow body and rotatable thereabout, and a

pair of oppositely positioned protuberances on the depending flange extending from the top flat portion to the lateral flange and having rib-like serrations thereon for facilitating gripping of the cap for ease in rotating the cap about the open end of the hollow body; and

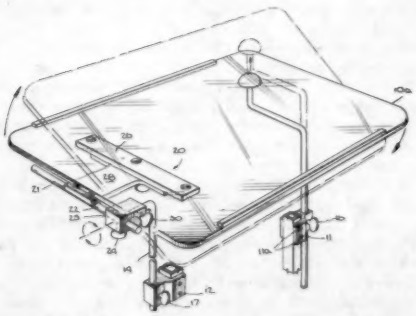
said depending flange having a plurality of semi-circular windows therein for exposing the hour indicia on the hollow body, the distance between the first window, and the second window being a quarter of a circumference from left to right to provide the cap with a pre-set-3-hour time-interval automatic time setter and reminder for use in the administration of prescribed medication having a 3-hour frequency of drug-dose intake.

4,405,046

TRAY ATTACHMENT FOR A CHAIR

Roland P. Schultz, Costa Mesa, and Steven P. Schultz, Huntington Beach, both of Calif., assignors to LPS Industries, Inc., Newark, N.J.

Filed Nov. 1, 1982, Ser. No. 438,318
Int. Cl.³ F16M *13/00;* **B65D** *1/34*
U.S. Cl. 206—557 **2 Claims**



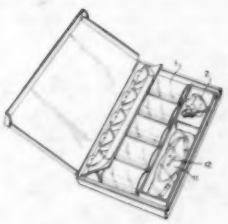
1. An improved tray assembly for a chair, wherein such tray is mounted to the chair for pivotal movement from a usable horizontal disposition to a vertically disposed storage position adjacent the chair, the improvement comprising: a planar tray member; bracket means for use in attaching the tray member to the chair, said bracket means being disposed at a side position of the tray member and having a mounting pin extending in a forward-rearward direction with respect to the tray member; a mounting block having an opening for receiving a free end of the mounting pin, and having means for locking the pin within said opening to prevent slidable or rotative movement thereof, wherein said locking means is releasable to permit the pin and tray member to be rotated, with respect to the axis of the pin, for selective movement between its said horizontal usable position and said vertical storage position; an assembly comprising a transverse rod and vertical rod, and means for connecting said rod assembly to one side of the chair and for vertically positioning said rod assembly at a desired height with respect to the chair, wherein said transverse rod is receivable in an opening of said mounting block, disposed at right angles to said pin opening, to permit the tray to be tilted about the axis of the transverse rod; and an opposed vertical rod disposed at the side of said chair opposed to said rod assembly, and a mounting device for selectively adjusting the vertical height of said opposed rod, wherein the upper end of said opposed rod contacts the underside of said tray member to support same, and wherein the position of said contact is displaced from the axis line of said transverse rod.

4,405,047

UNIT PACKAGE FOR POULTRY VACCINATION

Robert L. Barba, Georgetown, Del., assignor to Sterling Drug, Inc., New York, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,318
Int. Cl.³ B65D *83/00;* **A61B** *17/20*
U.S. Cl. 206—570 **1 Claim**



1. A unit package for use in connection with a system for supplying liquid vaccine composition to an apparatus for substantially simultaneously debeaking and vaccinating poultry chicks said package comprising a compartmentalized container the compartments of which contain

(a) a plurality of liquid diluent supply bottles containing sterile diluent for rehydrating dehydrated vaccine,

(b) a transfer spike assembly comprising a cover unit sealed with a tear-away cover and containing a transfer spike suitable for providing sterile flow means from a liquid diluent supply bottle to a bottle containing dehydrated vaccine, and

(c) a drip chamber-tubing-clamp assembly suitable for sterile transfer of liquid vaccine from a liquid supply bottle to the liquid injecting means of an apparatus for substantially simultaneously debeaking and vaccinating poultry chicks.

4,405,048

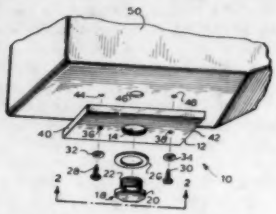
FUEL TANK DRAIN KIT AND PROCESS

Gilbert R. Peake, 16615 Bud Rd., Poolesville, Md. 20879

Filed Feb. 25, 1982, Ser. No. 352,242
Int. Cl.³ B65D *69/00, 71/00*
U.S. Cl. 206—582 **2 Claims**

1. A fuel tank adaptor kit for converting an existing fuel tank of a motor vehicle to permit it to be periodically partially or totally drained to rid the fuel tank of contaminants comprising a flat metallic plate attaching member having a threaded hole located through its central portion and a plurality of un-

threaded holes located away from the central portion of said flat metallic plate attaching member that extend completely through said attaching member, a threaded member for closing the threaded hole in said flat metallic plate attaching member, an oil resistant washer sized and shaped to fit around said threaded member, screw members adapted to fit into the unthreaded holes to be seated into holes in said fuel tank to secure said flat metallic plate attaching member to said fuel tank, oil resistant washers sized and shaped to fit on said screw members to prevent leakage of fuel from said fuel tank when said screw members and associated oil resistant washers are in place and means for attaching said flat metallic plate attaching member to said fuel tank comprising a cement.

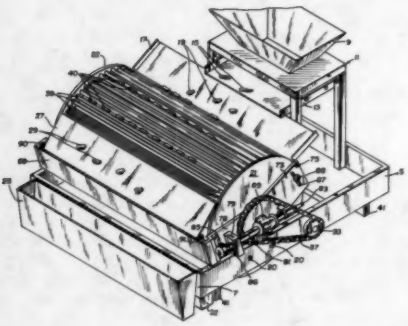


4,405,049

CAPSULE INSPECTION DEVICE

Stephen J. Deitz, 1707 Certainty Dr., Point Pleasant, N.J. 08742

Filed Oct. 13, 1981, Ser. No. 310,799
Int. Cl.³ B07C *5/36, 7/00*
U.S. Cl. 209—630 **6 Claims**



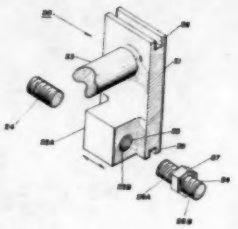
1. A capsule inspection device comprising a pair of stationary flanged discs mounted in spaced parallel vertical planes with their centers aligned to define the ends of a large cylinder, the smaller diameters of said flanged discs facing each other, each said flanged disc having a rotating disc mounted adjacent thereto and parallel and concentric therewith, said rotating discs being between said flanged discs and having smaller diameters than said flanged discs, said rotating discs having radial projections therein, skirts attached to the lower portions of the larger diameters of said flanged discs and extending inwardly toward said rotating discs, an array of rollers forming the curved surface of said large cylinder, said rollers being slightly shorter than the spacing between the flanges of said flanged discs so that they rest on the smaller diameter of said flanged discs between adjacent radial projections of said rotating discs, the diameter of said rollers and the spacing between them being chosen so that medicinal capsules to be inspected can array themselves in linear arrays between adjacent rollers and be rotated thereby, means to sychronously drive said rotating discs from a common source, capsule supply means at the rear of said array of rollers and a capsule discharge means at the front of said array rollers.

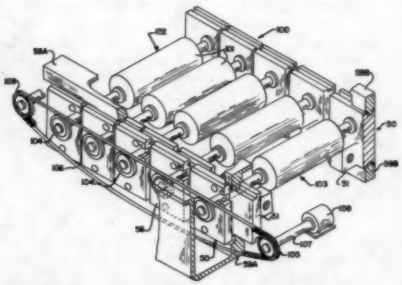
4,405,050

QUICK ROLL ADJUSTMENT FOR A ROLLER SCREEN CONVEYOR

Edward A. Fenton, Jr., Pittsburgh, and John F. Simpson, Jr., Eighty Four, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1981, Ser. No. 330,460
Int. Cl.³ B07B *1/14*
U.S. Cl. 209—668 **21 Claims**





1. In a roller screen conveyor hving a frame with a plurality of spaced parallel rollers mounted thereon, each with its longitudinal axis normal to the longitudinal axis of the conveyor, an apparatus for adjusting and rigidly fixing the spacing between adjacent rollers comprising:

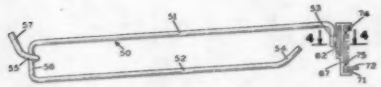
a plurality of roller support blocks slidably mounted on the frame of the conveyor and movable in a direction parallel to the longitudinal axis thereof, each roller support block rotatably supporting an end of a roller and having two adjustment engaging means oppositely extending normal to the axis of rotation of the roller and parallel to the longitudinal axis of the roller screen conveyor; and

a plurality of independent adjusting means for independently and rigidly fixing the spacing between adjacent support blocks, each adjusting means positioned intermediate confronting adjustment engaging means of adjacent support blocks and engaging the adjustment engagement means to form a structure of alternating support blocks and adjustment means, such that extension of the adjustment means in a line sustantially parallel to the longitudinal axis of the conveyor moves the adjacent support blocks farther apart while retraction of the adjustment means along a line substantially parallel to the longitudinal axis of the conveyor moves the adjacent blocks closer together without affecting the spacing between the other slidably mounted support block similarly connected to the other adjustment engaging means of the support blocks being adjusted.

4,405,051
MERCHANDISE HOOK

David R. Thalenfeld, Beechurst, N.Y., assignor to Trion Industries, Inc., Wilkes-Barre, Pa.

Division of Ser. No. 151,357, May 19, 1980, Pat. No. 4,351,440, which is a continuation-in-part of Ser. No. 918,483, Jun. 23, 1978, abandoned. This application Jan. 18, 1982, Ser. No. 339,885
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.
Int. Cl.³ A47F 5/00
U.S. Cl. 211—57.1 15 Claims

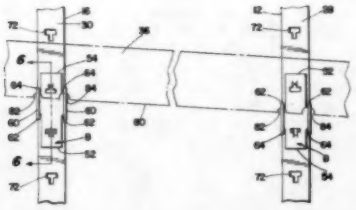


1. A display member for a display structure to display labels or other information, said member having means for being mounted upon said display board, wherein
(a) said member comprises a wire-like element,
(b) said wire-like element including an outwardly projecting display arm,
(c) a mounting plate being rigidly and transversely secured to an outer end extremity of said display arm,
(d) a plate-like label holder comprising an extruded section having upper and lower rearwardly projecting mounting flanges adapted for tight slideable engagement with said mounting plate,
(e) said label holder being of any predetermined length, whereby the label holder may have a length independent of the length of the mounting plate.

4,405,052
SHELF SUPPORT BRACKET

Dennis J. Spiros, Punta Gorda, Fla., assignor to Nestier Corporation, Cincinnati, Ohio

Filed Sep. 22, 1980, Ser. No. 189,196
Int. Cl.³ A47F 5/00
U.S. Cl. 211—49 D 19 Claims

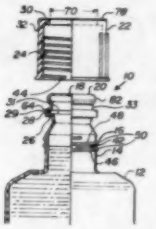


1. A bracket for supporting shelves on vertical columns, said columns having at least one vertical row of mounting holes; a substantially flat and generally rectangular plate having opposite end edges and opposite side edges, first and second vertically spaced mounting means on said plate for mounting said plate to respective first and second ones of said mounting holes, at least one integral flange for engaging said shelves bent from one of said side edges and extending generally perpendicular to said plate, said flange having opposite flange end portions provided with opposite first and second hooks opening outwardly toward said opposite end edges respectively, said first hook being spaced a first certain distance from said first mounting means, said second hook being spaced a second certain distance from said second mounting means, said first and second distances being of different length so that said plate may be mounted with said first and second mounting means respectively engaging said first and second holes for supporting a shelf on said one hook and may be mounted inverted with said first and second mounting means respectively engaging said second and first holes for supporting the shelf on said second hook to thereby change the elevation of said shelf.

4,405,053
TAMPERPROOF CLOSURE SYSTEM FOR PLASTIC CONTAINERS

Harrison Cherot, McHenry, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 27, 1981, Ser. No. 258,191
Int. Cl.³ B65D 1/02
U.S. Cl. 215—32 23 Claims



1. An improved tamperproof closure system for molded plastic containers having a threaded container neck sealed at its distal end, said closure system comprising:
a screw-type cap having internal threading constructed and arranged for threaded engagement with said container neck;
flange means integrally formed in and extending substantially radially from said container neck with a frangible annular groove circumferentially disposed about said flange means constructed and arranged to rupture when force is applied to said distal end of said container neck;
shoulder means disposed about said screw-type cap, constructed and arranged for abutment with said flange means whereby downward rotation of said screw cap is effective to rupture said frangible annular groove, and sever said distal portion of said container neck from the remainder thereof; and
stop means positioned proximate said threads about said container neck, said stop means being constructed and arranged for selective limitation of the downward rotation of said screw cap onto said container neck to a point short of that required to rupture said frangible annular groove so as to prevent inadvertent opening of said container and to indicate when said container has been opened.

4,405,054
CONTAINER INCLUDING PRESSURE MOUNTED INNER COVER

Morris Braun, Chicago, and Karen A. Wavering, Villa Park, both of Ill., assignors to W. Braun Co., Chicago, Ill.

Continuation of Ser. No. 152,334, May 22, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,094
Int. Cl.³ B65D 51/18
U.S. Cl. 215—277 1 Claim

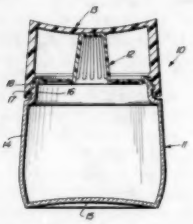
1. An improved double seal container comprising:
a bottle or jar portion including a circumferentially curved first side wall and an integral bottom enclosing wall; said first side wall including a first annular lip at the top thereof and means on an outer portion of said first side wall subjacent said lip for securing a closure cap thereto;
said first lip including a top surface being substantially horizontal, an inner vertical surface, an outer generally verti-

cal annular surface extending generally downwardly from an outer edge to said top surface toward said closure cap securing means;

a closure cap having a curved second side wall including a second annular lip at the bottom thereof and an integral top enclosing wall, means on an inner portion of said second side wall substantially immediately above said lip for matingly securing said cap to said jar portion securing means, and an annular wiping seal positioned inwardly adjacent and above said securing means for providing a first sealing engagement between said closure cap and said outer annular surface of said first lip thereof when said cap is closed thereon;

a one-piece sealing cover including an annular outer rim portion, a web portion, and a hub portion, all of substantially constant cross-sectional thickness, said outer rim portion including a radially extending wall for resting on top of said lip top surface of said jar and an axially oriented cylindrical wall extending downwardly from an inner edge of said radial wall for engaging said inner surface;

said web portion defining a generally frusto-conical wall with an inner boundary thereof joining said hub portion at a bottom thereof and an outer boundary thereof defining a resilient annular trough joining said axially oriented cylindrical wall at a bottom thereof;



said hub portion including a top wall and a generally cylindrical wall extending axially between said top wall and said web portion, said generally cylindrical wall including a surface thereon suitable for grasping retention by a user of said container when removing said cover from said jar portion annular lip and when positioning said cover on said jar portion annular lip,

said closure cap top wall including an inner surface having a central portion thereof which is adapted, when mounted on said jar portion, to press on said hub portion, deform said web portion, and move said outer rim portion thereof into a second sealing engagement with said jar lip defining a continuous two surface annular engagement between said outer rim portion and said jar lip, said engagement surfaces being L-shape in vertical cross section and positioned for engagement independently of said first sealing engagement, and a first perpendicular distance between said inner surface central portion and said annular wiping seal being less than a second perpendicular distance between said top wall of said hub and said radially extending wall of said outer rim portion when said sealing cover web portion is undeformed and greater than said second perpendicular distance when said sealing cover web portion is deformed.

4,405,055

VAULTED COVER WITH FLANGE AND PLURALITY OF PIPE FITTINGS

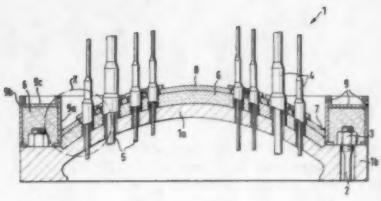
Reinhold Koerdt, Hemsbach; Josef Schoening, Hambruecken, and Hans-Georg Schwiers, Ketsch, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,815

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005905

Int. Cl.³ B65D *6/10*

U.S. Cl. 220—215 **13 Claims**



1. A vaulted cover for an opening in a pressure vessel comprising:

a first metal covering having a vaulted center piece and an annular rim member;

a plurality of pipe fittings welded onto said first covering;

a second metal covering adjacent said first metal covering, forming a space therebetween and having an annular flange;

thermal insulation material in said space between said first and second metal coverings;

said rim member comprising an inner annular cylindrical section and an outer cylindrical section coaxially arranged to form an annular space therebetween and a disk-shaped member covering said annular space

wherein said vaulted center piece is welded to the inner cylindrical section and both of said cylindrical sections are fastened to said flange on said second metal covering by a sliding seat.

4,405,056

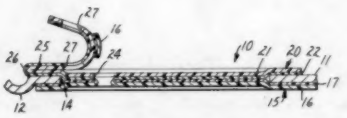
CONTAINER CLOSURE SYSTEM WITH VENT OPENING THROUGH THE CLOSURE TAPE

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 17, 1982, Ser. No. 378,985

Int. Cl.³ B65D *41/02*

U.S. Cl. 220—271 **10 Claims**



1. A container end assembly comprising:

a container end with an interior surface, exterior surface and a pour opening therein, and an easy-opening closure system covering said pour opening comprising:

an interior tape having an adhesive on one surface adhered to the interior surface of the container end and covering said pour opening,

an exterior tape covering the pour opening and adhered therein to said interior tape, said exterior tape having a vent opening formed therein in the area of the pour opening and exposing the adhesive surface of the inte-

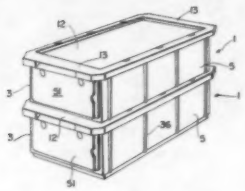
rior tape, said exterior tape being formed at one end beyond said opening with a pull tab covering a portion of said exterior tape and said vent opening, and said pull tab being secured firmly to the exposed adhesive of the interior tape at said vent opening in the exterior tape.

4,405,057

SECURITY BOX HAVING SLIDING CLOSURE

Eric D. Stein, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio

Filed Nov. 3, 1981, Ser. No. 317,757
Int. Cl.³ B65D *43/20*
U.S. Cl. 220—346 **21 Claims**



1. A security storage box for papers of a similar size, such as checks, comprising:

a one-piece molded synthetic resin open-topped container having opposed generally parallel side walls, opposed generally parallel end walls, and a rectangular bottom wall integrally connected around its entire periphery with respective lowermost edges of said side and end walls, with said side and end walls being serially connected together in a closed alternate array along adjacent vertically extending edges;

the upper edge portions of said side and end walls opposed to said bottom wall including integrally formed outwardly extending horizontal flanges connected together around substantially the entire upper periphery of said container to constitute side and end flanges, said side flanges having a plurality of through apertures;

a lid separate from said container and integrally molded from synthetic resin in one piece, said lid being of a size and a rectangular shape to close the open top of said container with the peripheral edge portion of said lid being rectangular and having a flange overlying the flanges of said container, said lid integrally being formed with a plurality of hooks depending in one piece from its peripheral edge portion in alignment with and to extend through said through apertures of said container; and

said hooks and through apertures being of a size and shape so that in one relative position of said lid and container said lid may be translated generally vertically from a disengaged position above said container to a closed position on said container with said hooks extending completely through said apertures and thereafter translated horizontally parallel to said side walls to engage said hooks beneath said container flanges to a locked position.

4,405,058

CONTAINER

Thomas L. Phalin, Cary, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 13, 1981, Ser. No. 234,452
Int. Cl.³ B65D *8/04, 25/14*
U.S. Cl. 220—458 **5 Claims**

1. In a food container fashioned from a blank of metal having a predetermined thinness and including a cylindrical sidewall with a flange at one end and a bottom wall across the other for receiving foodstuffs and capable of withstanding internal and external pressure in connection with hermetic sealing, retorting and storing operations, the improvement therein wherein:

(a) said blank from which said sidewall and said bottom wall are fashioned is of high temper and double reduced metal,

(b) said blank has precoated bonded protective layers on its two major surfaces,

(c) said precoated metal is drawn throughout its sidewall length,

(d) said precoated metal is ironed throughout its sidewall length between the areas of said flange and said bottom wall to provide uniform thickness therealong,

(e) said sidewall is elongated as a result of drawing and ironing to a length substantially greater than the diameter of said bottom wall,

(f) said bottom wall after said sidewall is elongated to its final height is generally of said blank predetermined thinness prior to any configurative deformation thereof, and

(g) said sidewall having a thickness resulting from ironing throughout its length being only slightly thinner on the order of 0.001" thinner than said predetermined thinness,

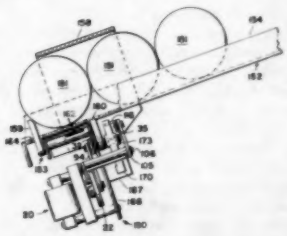
thereby to provide a container having a fully coated sidewall with said bonded protective layers of generally uniform thickness throughout its length as a result of said ironing and wherein said ironing has further worked said high temper double reduced metal thereof thereby further enhancing overall strength of the container while maintaining a sidewall and fully coated bottom wall of closely similar thicknesses.

4,405,059

SELECTABLE COUPLING MECHANISM INCLUDING ARTICLE DISPENSERS

Leo Kull, 58 Westover Ave., W. Caldwell, N.J. 07006

Filed Jul. 9, 1981, Ser. No. 281,671
Int. Cl.³ B65G *59/08*
U.S. Cl. 221—129 **36 Claims**



1. An electrically selectable multistation coupling mechanism comprising a control cam, an electric motor for rotating said control cam, more than one coupling station each having an electrical actuator, a pivoting member and a coupler pivotally secured to said pivoting member; said control cam controlling electrical switching means for energizing and deenergizing said electric motor, said control cam having means to reciprocate a driving member reaching all of said coupling stations and being in contact with said pivoting members, said

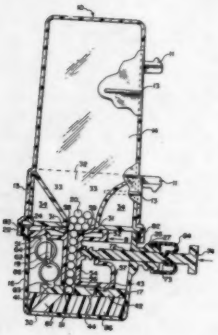
couplers having a non-active and active position responsive to the excitation of said electrical actuator, all of said couplers being in contact with a starting member, an excitation of said electrical actuator causing a motion to said coupler, said motion providing an engagement between said coupler and said driving means, said motion causing a switchover to said electrical switching means for starting said electric motor; said driving means reciprocating said pivoting member together with said engaged coupler, said coupler being resettable to said inactive position during the return half of said reciprocating motion when said driving means is driving said pivoting member back to its initial position.

4,405,060

TABLET DISPENSING DEVICE

Paul K. Hsei, Huntington Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 20, 1981, Ser. No. 285,022
Int. Cl.³ B65D *83/04*; B65G *59/06*
U.S. Cl. 221—135 **33 Claims**



1. A tablet dispenser for dispensing a solid tablet or a predetermined number of tablets of a substantially uniform size from a storage area containing a relatively large number of tablets into a dispensing orifice upon operation of an external actuating mechanism, said tablet dispenser comprising:

a hollow body having an upper portion for storing the relatively large number of tablets and a lower base portion having the dispensing orifice formed in its bottom;

a gate member mounted for reciprocal movement above said tablet dispensing orifice, said gate member having a tablet receiving area formed therein;

a field organizing member mounted for reciprocal movement below said tablet storage portion and above said gate member, said organizing member having a tablet receiving area which communicates with said tablet storage portion and is unitary with said organizing member;

said tablet receiving area of the organizing member further having an agitator means for engaging said tablets and changing their array as said organizing member is reciprocated, and for guiding said tablets into the tablet receiving area of said organizing member;

interconnecting means for reciprocating said gate member and said organizing member in directions opposite each other, whereby said gate member may be reciprocated from a tablet dispense position wherein its tablet receiving area is in communication with said tablet dispensing orifice to a tablet receiving position wherein its tablet receiving area is in communication with said tablet receiving area of said organizing member; and

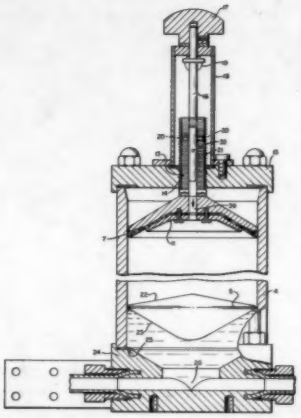
actuating means for causing reciprocal movement of said gate member and said organizing member in response to the operation of the external actuating mechanism.

4,405,061

FILLING MACHINE

Wieslaw Bergandy, Arnold, Md., assignor to National Instrument Co., Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 293,859, Aug. 18, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,244
Int. Cl.³ B67D *5/30*
U.S. Cl. 222—21 **21 Claims**



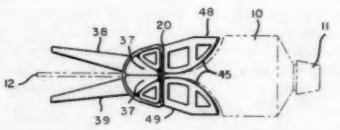
1. A filling machine for supplying predetermined quantities of liquid comprising measuring chamber means, float means positioned with clearance in said chamber means and adapted to move up and down in at least a portion of said chamber means with the level of liquid in said chamber means, abutment means positioned in said chamber means above said float means for limiting the upward movement of said float means in said chamber means, and seal means adjacent said abutment means for sealing against said chamber means, said seal means being arranged such that it can be moved into and out of sealing engagement with the chamber means without disassembly of the filling machine thereby facilitating cleaning of said machine.

4,405,062

TUBE DISPENSING DEVICE

Eraine J. Tschida, Sr., 3915 Buckley Pl., Missoula, Mont. 59801

Filed Oct. 19, 1981, Ser. No. 312,655
Int. Cl.³ B65D *35/28*
U.S. Cl. 222—102 **6 Claims**



1. A tube dispensing device for use in manually emptying deformable tubes of the type containing soft paste comprising:

an upper fractional roller wider than the tube to be evacuated, with rounded side down,

a lower fractional roller of similar width with rounded side up and located so that the upper rounded side contacts the rounded side of the upper fractional roller,

an upper generally horizontal lever of width similar to that of fractional rollers having a raised ridge at the front end of the lower surface and having a generally wedge-shaped front end with the top surface tapering down to the lower

front end and upper lever also having raised pivot points on the lower surface near the front end toward the sides,

a lower generally horizontal lever of width similar to upper lever being located beneath the upper lever having a raised ridge at the front end of the upper surface so as to meet the ridge of the upper lever and having a generally wedge-shaped front and with the bottom surface tapering up to the upper front end and lower lever also having raised pivot points on the upper surface near the front end toward the sides so as to meet the pivot points of the upper lever,

resilient securing means to hold the rearward ends of the fractional rollers and the forward ends of the levers in proximity, with the wedge portions of the levers fitting in the gap at the rearward end of the rollers,

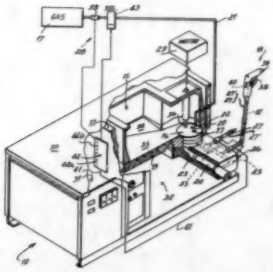
the upper and lower fractional rollers having adaptations at the rearward ends to receive the securing means and the upper and lower levers having adaptations at the forward ends to receive the securing means.

4,405,063

METHOD AND APPARATUS FOR CONTROLLING THE DENSITY OF DISPENSED HOT MELT THERMOPLASTIC ADHESIVE FOAM

Jan J. Wydro, Lilburn; Charles H. Scholl, Duluth, and William R. Coker, Lilburn, all of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Feb. 27, 1981, Ser. No. 239,173
Int. Cl.³ B67D *5/34*
U.S. Cl. 222—146 HE **19 Claims**



1. Apparatus for controlling the uniformity of dispensed hot melt thermoplastic foamed adhesive comprising:

means for heating solid thermoplastic adhesive material for converting said solid adhesive material to a molten state;

means for supplying gas;

means for agitating and pressurizing said molten adhesive in the presence of said gas so as to force said gas into solution with said molten adhesive;

means for dispensing said molten adhesive and gas solution at a pressure below the solution maintenance pressure of said solution whereby said gas is released from solution and forms an adhesive foam; and

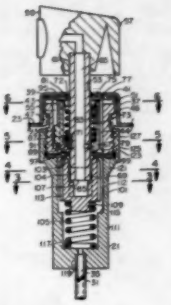
means for selectively controlling said gas supplying means so that additional gas is supplied to said agitating and pressurizing means in response to actuation of said dispensing means.

4,405,064

SELF-CLEANING, ISOLATED PRODUCT, AEROSOL SPRAY ATOMIZING VALVE

William R. Stoody, 8659 Summerdale Rd., San Diego, Calif. 92126

Filed May 26, 1981, Ser. No. 266,747
Int. Cl.³ B65D *83/00, 83/14*
U.S. Cl. 222—148 **6 Claims**



1. A self-cleaning dispensatory valve for co-fluid dispensing, adapted to maintain separation of a pressurizing first fluid from a second fluid prior to effluence, which comprises;

a first fluid transit chamber having a first fluid discharge control element resiliently located therein;

a second fluid transit chamber having a second fluid discharge control element resiliently located therein;

an assemblage retainment member mounted on said first fluid transit chamber;

a first sealing means securingly disposed interjacent said assemblage retainment member and said first fluid transit chamber;

a second sealing means separating said first fluid transit chamber from said second fluid transit chamber;

a dispensatory means which includes a dispensing head and discharge communication passageways extending from said first and second fluid transit chambers to said dispensing head;

said dispensatory means being adapted to co-operatively interosculate said first and second fluid discharge control elements to selectively effect discharge of said fluids;

said second fluid discharge control element having outlet surfaces which remain in communication with said dispensing head;

said dispensatory means further including a fluid by-pass means which is adapted to purgingly direct fluid from said first fluid transit chamber to said outlet surfaces of said second fluid discharge control element and therefrom effect cleaning of said dispensatory means while maintaining the integrity of first and second fluids awaiting discharge.

4,405,065

TILT VALVE STRUCTURE WITH BRIDGED STOP FOR VISCOUS FLOW LIQUIDS

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Aug. 5, 1982, Ser. No. 405,685
Int. Cl.³ B67D *5/32*
U.S. Cl. 222—153 **10 Claims**

1. A fluid dispensing valve structure for dispensing the contents of a pressurized container comprising:

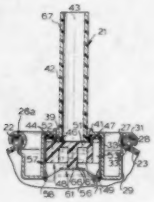
a mounting cup member securable to said pressurized container and having communications with the pressurized contents of said container,

a resilient seal member carried in said mounting cup member,

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second end supported in said mounting cup member by said resilient seal member in a generally upright extending position,

a moveable valve cup member reciprocably slidably carried within said mounting cup member and normally being biased against said resilient seal member to form a seal means for normally sealing the contents of said container, and

distortable bridge stop means associated with said mounting cup member in adjacent relationship to said moveable valve cup member, said bridge member being capable of assuming two configurations, one configuration being an initially assembled arrangement wherein said bridge stop means maintains said moveable valve cup means in an



initially sealed condition against said resilient seal member, the second configuration being a dispensing arrangement wherein a portion of said bridge stop means is displaced away from said initially assembled arrangement,

means for distorting said bridge stop means from said initially assembled arrangement to said dispensing arrangement and also for opening said valve structure from said initially sealed condition, said means including foot means extending from said moveable valve cup member to an initial contact with said portion,

said second end being engageable with said moveable valve cup member,

whereby when an external operating deflecting force is applied when said one end, said second end causes said distorting means to move said bridge means from said one configuration to said second configuration.

4,405,066

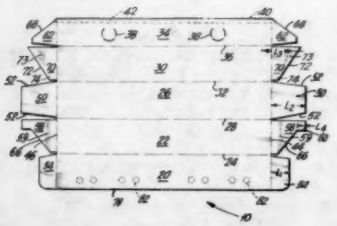
DISPENSER CARTON WITH IMPROVED END CLOSURE

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 25, 1981, Ser. No. 305,618

Int. Cl.³ B65D *85/671*

U.S. Cl. 225—43 **25 Claims**



25. A paperboard blank for forming a dispenser carton having end closures sealable on automatic equipment comprising:

generally rectangular front, bottom, rear, top and outer panels hingedly connected in series; and

two sets of end closure flaps for sealing the ends of the erected carton, each set of end closure flaps respectively hingedly connected to the opposed side edge of said blank, with each set including,

a first flap hingedly connected to said rear panel and having a generally rectangular configuration,

a second flap hingedly connected to said front panel, said second flap being generally rectangular in configuration and extending away from said front panel a distance less than the width of said top and bottom panels,

a third generally triangular flap hingedly connected to said bottom panel, said third flap extending away from said bottom panel a distance less than the width of said rear panel, and one leg of said triangular third flap being substantially colinear with the hinged connection between said bottom and rear panels,

a fourth generally triangular flap hingedly connected to said outer panel and having a configuration complimentary to said third flap, said fourth triangular flap having one leg which is substantially colinear with the hinged connection between said top and outer panels; and

a fifth generally triangular flap hingedly connected to said top panel, said fifth flap extending away from said top panel a distance less than the width of said rear panel, said triangular fifth flap having a configuration complimentary to said third flap, and said fifth triangular flap having one leg which is substantially colinear with the hinged connection between said top and outer panels.

4,405,067

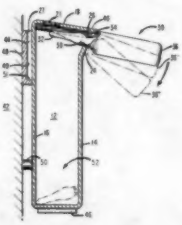
AMPOULE OPENER

Peter L. Caron, 342 Washington St., Arlington, Mass. 02174

Filed Jun. 25, 1981, Ser. No. 277,145

Int. Cl.³ B26F *3/00*

U.S. Cl. 225—93 **6 Claims**



1. An ampoule opener for severing the ampoule tip from an ampoule body at a narrowed neck disposed therebetween to open the ampoule, said ampoule opener comprising:

a housing;

a front face disposed on said housing and having a primary opening therein, said opening being of sufficient size to permit ampoule tips of several different diameters to pass therethrough;

a projection extending outwardly from said front wall adjacent said primary opening on one side thereof and forming a support adapted to receive the neck portion of the ampoule, the ampoule being adapted to be pivoted thereabout;

an upper bearing surface formed on interior portions of said housing adjacent said projection, said bearing surface being adapted to resist motion of said ampoule tip pressed thereagainst as force is applied to a lower portion of said ampoule body to pivot said ampoule neck about said projection to sever said ampoule tip from said ampoule body at its neck, said bearing surface being inclined downwardly toward said opening; and

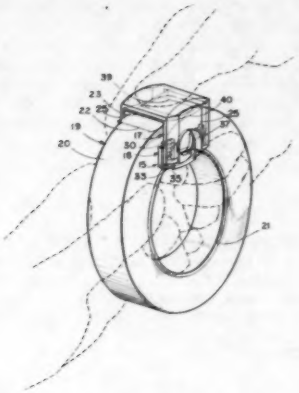
means disposed within the housing for collecting severed container tips.

4,405,068

PORTABLE ROLL-RIDING TAPE CUTTER

Bruce A. Blair, 720 W. California Ter., Chicago, Ill. 60657

Filed Jun. 25, 1981, Ser. No. 277,229
Int. Cl.³ B65D *85/671*; B26D *1/02*
U.S. Cl. 225—65 **17 Claims**



1. In a tape cutter assembly having a pair of complementary collapsibly interengageable members adapted to receive therebetween and ride circumferentially about an annular roll of tape wound on a ring-shaped core, one of said members adapted to engage the outer diameter of the roll and the second of said members adapted to engage the inner diameter of the roll, an edge on said one member arranged to extend across the roll outer diameter for severance of selective terminal lengths of tape stripped from the roll and manipulated into severing relation against said edge, telescopically engageable legs on said members for straddling the sides of the roll and equipped with complementary separable interdigitating retaining ribs for holding the members in assembly against unintentional separation from one another radially relative to the roll, and means cooperating with said retaining ribs for maintaining said members against displacement relative to one another circumferentially of the roll, the improvement comprising:

said second member being reversible relative to said one member;

and oppositely convexly curved bearing surfaces on said second member substantially matching inside diameter roll surface curvature to facilitate maximum severed tape strip utilization from the roll by reversing said second member relative to said one member as the tape in the roll diminishes during use of the assembly.

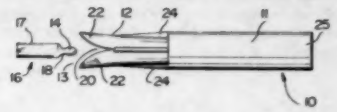
4,405,069

AMPOULE BREAKER

Ghislain Vivier, P.O. Box 247, Val Therese, Ontario, Canada P0M 3B0, and Aurele Gauthier, 119 Vailliancourt Cr., P.O. Box 698, Chelmsford, Ontario, Canada P0M 1L0

Filed Apr. 14, 1981, Ser. No. 254,180
Claims priority, application Canada, Oct. 30, 1980, 363640
Int. Cl.³ B26F *3/00*
U.S. Cl. 225—93 **9 Claims**

1. An ampoule breaker comprising a body member capable of being held in a person's hand, said member including a hollow end portion constructed of flexible, resilient material and having an open end adapted to receive an ampoule head, wherein said end portion is formed with slots extending axially from said open end, said slots comprising two generally V-shaped slots located on diametrically opposite sides of said end portion, the narrow end of each slot being disposed away from said open end to permit said end portion to be compressed



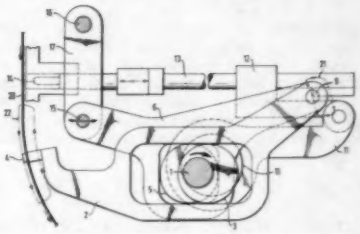
between the person's fingers so that an ampoule located in said end portion can be firmly held therein and broken off by finger manipulation of said breaker.

4,405,070

FILM TRANSPORT MECHANISM

Otto Blaschek, Aschheim, Fed. Rep. of Germany, assignor to Arnold & Richter Cinetechnik GmbH, & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 237,658
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 8005124[U]; Jan. 21, 1981, 3101813
Int. Cl.³ G03B *1/28, 1/22*
U.S. Cl. 226—55 **8 Claims**



1. A film transport mechanism comprising:

a drive shaft;

cam control means mounted for rotation with said drive shaft; and

a shuttle frame pivotally and longitudinally movable by said cam control means, said shuttle frame having a transport pin engageable with a film perforation for advancing the film when said shuttle frame is moved by said cam control means;

said cam control means comprising:

a first constant-diameter cam wheel mounted on said drive shaft and directly engaged with said shuttle frame;

a second constant-diameter cam wheel mounted on said drive shaft;

a rocker engaged and moved by said second cam wheel, said rocker having a first end portion pivotally engaged with said shuttle frame and a second end portion; and

means for guiding movement of said second end portion of said rocker.

4,405,071

FASTENER DRIVING TOOL

Ronald Austin, Hazelcrest, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Sep. 14, 1981, Ser. No. 301,958
Int. Cl.³ B27F *7/02*
U.S. Cl. 227—7 **12 Claims**

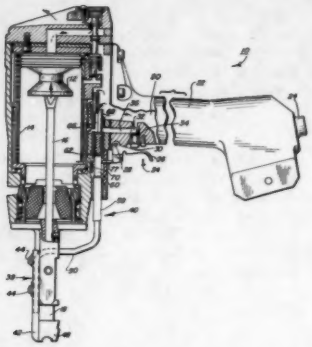
1. In a fastener driving tool for driving fasteners into a workpiece, the improvement comprising:

a trigger assembly movable from an inoperative position to an operative position to control operation of the tool,

a workpiece responsive assembly movable from an inopera-

tive position to an operative position as the tool is moved adjacent a workpiece, and

a safety control assembly coupling said trigger assembly and said workpiece responsive assembly to control operation of the tool, said safety control assembly including means coupled to said workpiece responsive assembly for actuating said tool and a blocking member for blocking movement of said actuating means to an operative position and



(1) positioned in a non-blocking position in response to movement of both said trigger and workpiece responsive assemblies to their operative positions for effecting operation of said tool to drive a fastener, and (2) positioned in a blocking position in response to movement of the trigger assembly to its operative position prior to movement of the workpiece responsive assembly to its operative position.

4,405,072

SETTING DEVICE POWERED BY AN EXPLOSIVE GAS MIXTURE

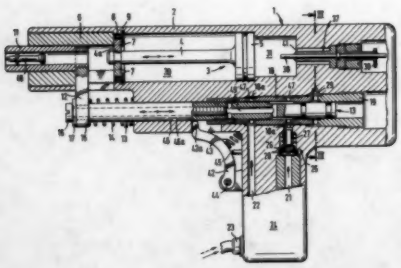
Edwin Kindle, Triesen, Liechtenstein, and Peter Jochum, Meiningen, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 27, 1981, Ser. No. 267,593

Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020268

Int. Cl.³ B25C *1/08*

U.S. Cl. 227—10 **9 Claims**



1. A fastening element setting device powered by an explosive gas mixture comprising a housing forming an axially elongated guide cylinder having a front end and a rear end, a propulsion piston slidably mounted in said guide cylinder, a combustion chamber located within said housing and opening into the rear end of said guide cylinder, an ignition device mounted within said housing and having a part thereof located within said combustion chamber for igniting an explosive gas mixture within said combustion chamber and generating pressurized gases for driving said propulsion piston in said guide cylinder, a first supply line in said housing for a first component of the gas mixture, a second supply line in said housing for a second component of the gas mixture with the second component being at a higher pressure than the first component, a control slide-valve displaceably mounted in said housing and located between said first and second supply lines and said combustion chamber for controlling the flow of the components of the explosive gas mixture one after the other into said combustion chamber, an inflow duct extending between said control slide-valve and said combustion chamber, a back-pressure valve located in said inflow duct between said control slide valve and said combustion chamber, and a closure valve in said first supply line disposed in the closed position when the higher pressure component of the gas mixture flows from said second supply line to said combustion chamber.

4,405,073

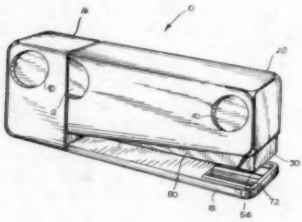
STAPLER WITH STAPLER STORAGE SPACE

Juan D. Salleras Escalante, c/o Ave. Principal de Campo Alegre, Quinte "San Luis", Caracas, Venezuela, assignor to Juan D. Salleras Escalante, Caracas, Venezuela

Filed Sep. 18, 1980, Ser. No. 188,326

Int. Cl.³ B27C *5/02*

U.S. Cl. 227—120 **6 Claims**



1. A stapler comprising a head, a back, and base; said head containing a staple driver means on an opposite end from the back and an interchangeable removeable staple magazine assembly horizontally slideably removable away from said head and said back through said opposite end, said magazine assembly comprising a magazine, a load pusher slideably mounted to said magazine, and a tensioned coiled spring completely enclosed within said magazine, and tensioned coil spring having a fixed end coupled to said magazine and a moveable end coupled to said load pusher, said load pusher being adapted to urge a load of staples through said magazine assembly to said staple driver means, said coil spring varying less than 50 percent in length as said load of staples is dispensed; said base being spaced apart from and below said head, said base having a staple anvil means directly below said staple driver means within said head; and said back having a spring rail means partially embedded within said back, said spring rail means connecting said back to said head and said spring rail means also connecting said back to said base, and wherein said magazine assembly further comprises a pivot pin fixed vertically within said magazine adjacent said staple driver means, said tensioned coil spring having said fixed end secured to an end of said magazine adjacent said back, said tensioned coil spring traversing the length of said magazine from said back to said pivot pin, said tensioned coil spring passing around said pivot pin and returning along the length of said magazine to said load pusher.

4,405,074
COMPOSITE BONDING TOOL AND METHOD OF MAKING SAME

Chaim Levintov, Hofit, and Michael Shienfeld, Herzeliah, both of Israel, assignors to Kulicke and Soffa Industries Inc., Horsham, Pa.

Filed Aug. 31, 1981, Ser. No. 297,867
Int. Cl.³ B23K *1/00, 5/00, 20/14;* B23P *9/00*
U.S. Cl. 228—41 15 Claims

1. The method of making a composite two piece bonding tool of the type comprising a bonding nib carried by a nib holder, the steps comprising:
providing a cylindrical shaped mono crystal synthetic jewel workpiece,
laser cutting a funnel shape into said synthetic jewel workpiece to provide an unfinished bonding nib,
providing a cylindrical nib holder, said nib holder having a cylindrical recesses in one end and a connecting larger cylindrical recess in the other end adapted to receive said unfinished bonding nib,
placing said unfinished bonding nib in said larger cylindrical recess of said nib holder to provide an unfinished composite bonding tool,
shrinking said nib holder to provide a shrink fit between said bonding nib and said nib holder,
grinding the outside diameter of said nib holder,
grinding an external cone shape onto the working end of said unfinished composite bonding tool, and
finishing the working face of said bonding nib by grinding and polishing.

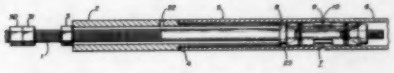
15. A composite two piece bonding tool comprising:
a sintered high density alumina nib holder,
said nib holder having a tapered fit hole in one end and a large connecting recess in the other end,
a synthetic jewel mono crystal bonding nib mounted in said large connecting recess in said nib holder,
said bonding nib being held in said recess by a shrink fit between said bonding nib and said nib holder,
said bonding nib having a funnel shape extending through the bonding nib and terminating in a substantially constant diameter bore at the working face of said bonding tool, and
said funnel shape being characterized by a smooth finish surface made by cutting said funnel shape with a laser beam.

4,405,075
STRUCTURE FOR ALIGNING AND BUTT-WELDING TUBE ENDS

Robert L. Roddy, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 11, 1981, Ser. No. 262,170
Int. Cl.³ B23K *37/06*
U.S. Cl. 228—49 B 1 Claim

1. A fixture with which to abutt two pipe sections while they are welded together, including;
an expandable section comprising,
a plurality of longitudinal segments arranged to nest together and form a central bore,
a spring member encircling the nest of segments to retain the segments yieldingly in their nesting relation to each other,
a first body having an internal bore aligned with that of the nested segments and providing a conical wedge surface inclined in the direction of the nest,
and a second body having an internally threaded bore aligned with the bore of the nested segments and providing a conical wedge surface inclined in the direction of the nest,
whereby the movement of the first and second bodies toward the nest engages the nest with their conical wedge surfaces to overcome the spring force to radially move the segments from their bore;
a threaded rod extended through the axially aligned bores of the first body and the bore of the nest to bring a shoulder on the threaded rod against the first body and into threaded engagement with the second body;
means for preventing rotation of the second body;

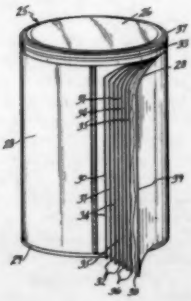


means for rotating the threaded rod in its engagement with the second body threads whereby rotation of the threaded rod in its engagement with the threads of the second body moves the first and second bodies toward and away from each other to alternately expand and contract the expandable section;
a sleeve member with a bore sized to journal the sleeve freely over the threaded rod comprising,
means for axially spacing the sleeve member from the expandable section,
and a shoulder formed on the sleeve member sized to engage the non-abutting end of one of the pipes;
means for fixing the axial position of the sleeve member along the threaded rod to engage the pipe and sleeve shoulder to bring the other end of the pipe to its junction with the end of the second pipe;
and passageways formed through the sleeve member to establish a flow of inert gas through the pipes.

4,405,076
FIRE AND HEAT RESISTANT STRUCTURE

Ellwood L. Lines, Jr., New Haven, and Douglas A. Farmer, Jr., Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 301,243, Sep. 11, 1981. This application Aug. 30, 1982, Ser. No. 412,471
Int. Cl.³ B32B *7/02, 15/08, 9/06;* B65D *1/00*
U.S. Cl. 229—3.5 MF 52 Claims



1. A fire and heat resistant container having a top and a

bottom interconnected by sidewall means, at least the sidewall means being partially formed from fibrous material and having an inner surface and an opposing outer surface with a plurality of laminae therebetween to protect an object adjacent the inner surface from a fire or heat generating source adjacent the outer surface, the combination comprising:

(a) a first lamina of predetermined thickness generally defining the inner surface and formed at least partially of aluminum;

(b) at least one ply adjacent the first lamina and comprising:

i. a second lamina of fibrous material of predetermined thickness and strength adjacent the first lamina;

ii. a third lamina of predetermined thickness having generally planar opposing sides;

iii. a fourth lamina of fibrous material of predetermined thickness and strength adjacent the third lamina;

iv. a first bonding agent bonding each lamina of fibrous material to each of the opposing sides of the third lamina; and

(c) a second bonding agent of predetermined thickness bonding the at least one ply to the first lamina.

4,405,077

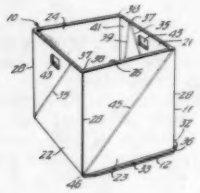
COLLAPSIBLE TALL CONTAINER

Julius B. Kupersmit, 229 W. 12th St., New York, N.Y. 10014

Filed Nov. 12, 1981, Ser. No. 320,328

Int. Cl.³ B65D *5/36*

U.S. Cl. 229—41 R **2 Claims**



1. An improved collapsible shipping container comprising: an open topped box-like element having a bottom wall, first and second oppositely disposed side walls, and first and second oppositely disposed end walls, each having a lower edge interconnected to a corresponding edge of said bottom wall; said side and end walls having an effective height substantially greater than half the horizontal length of said side walls, said side walls and end walls being interconnected to each other at vertical side edges thereof; each of said end walls having an angularly disposed fold line commencing at a lower corner thereof and extending to an upper diagonally disposed corner thereof; each of said side walls having a second angularly disposed fold line commencing at a lower corner and extending to an upper edge thereof and terminating a distance from the diagonally opposite corner thereof; one of said side walls having a third fold line commencing from the point of meeting of said second fold line with said upper edge of said wall, and extending downwardly to the corner of said side wall horizontally opposite the corresponding lower corner of said wall; whereby said side walls may be folded upon an upwardly facing surface of said bottom wall by first pushing inwardly at an upper corner of said one of said walls adjacent said second fold line to temporarily effectively shorten the width of said one of said side walls to enable it to clear the adjacent end wall, and permit, without interference, the progressive folding of the oppositely disposed end and side walls, and the adjacent end wall.

4,405,078

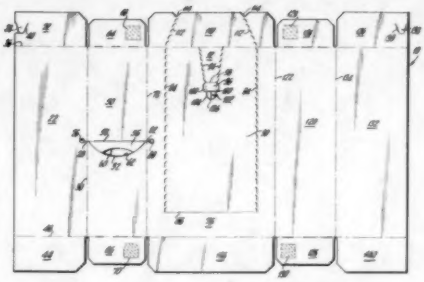
ARTICLE CARRIER AND A BLANK FOR FORMING THE SAME

Daniel P. Dutcher, Woodbury, Minn., and Harry I. Roccaforte, Western Springs, Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Jan. 30, 1980, Ser. No. 116,909

Int. Cl.³ B65D *5/46*

U.S. Cl. 229—52 B **7 Claims**



1. A blank for forming an article carrier with an integral handle comprising:

a first side panel;

a top panel hingedly connected along one side edge of said first side panel;

a bottom panel hingedly connected along the opposed side edge of said first side panel;

an outer side panel, said outer side panel being hingedly connected to the opposed side edge of said top panel;

an inner side panel, said inner side panel being hingedly connected to the opposed side edge of said bottom panel; and

handle means, said handle means including a cut line, said cut line having an arcuate portion disposed in said top panel and extending between the opposed side edges of said top panel and defining a handle tab, said cut line further including a pair of opposed straight portions disposed in said opposed outer and first side panels, said straight portions of said cut line being colinear with the hinged connection to said handle tab, said handle means further including a pair of stress relieving apertures being respectively disposed in said outer and first side panels, said stress relieving apertures being contiguous with the distal ends of said straight portions of said cut line.

4,405,079

CENTRIFUGAL DISPLACER PUMP

Donald W. Schoendorfer, Lexington, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Filed Nov. 10, 1980, Ser. No. 205,144

Int. Cl.³ B04B *9/12, 11/02*

U.S. Cl. 494—1 **3 Claims**

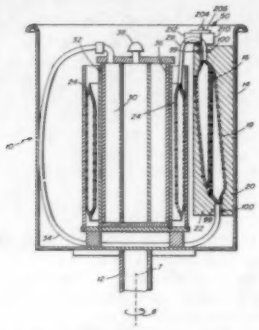
1. Apparatus for processing fluids, comprising, in combination:

a. a centrifuge having a rotor capable of rotating about an axis of rotation at speeds sufficient to produce a desired separation;

b. a processing chamber mounted on said rotor and supporting a flexible processing container and a flexible displacer fluid container;

c. a reservoir of displacer fluid mounted on said rotor nearer the axis of rotation of the rotor than said processing chamber and in fluid communication with said displacer fluid container; whereby, when said rotor is rotated at a speed sufficiently long to produce the desired separation, displacer fluid flows due to centrifugal force from said reser-

voir to said displacer container thereby expanding said displacer container to expel a separate fluid component from said processing chamber; and



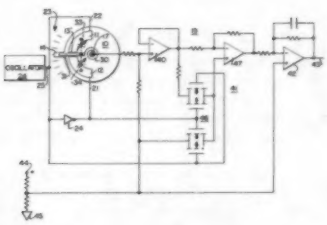
d. a rotatable member provided to control the amount of displacer fluid communicated from said reservoir to said displacer fluid container thereby controlling the amount of fluid component expressed from said processing chamber.

4,405,080

ELECTRONIC TEMPERATURE CONTROL FROM A MECHANICAL TEMPERATURE RESPONSIVE MEANS

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 12, 1982, Ser. No. 440,689
Int. Cl.³ G05D *15/00*; H01G *7/00*
U.S. Cl. 236—78 D **12 Claims**



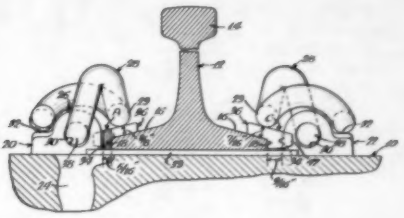
1. A mechanically controlled electronic thermostat, including: a rotatable insulating member having two electrically conductive areas on said rotatable member with said two areas electrically separated from each other by a nonconductive area; electric power supply means including an alternating current source having opposite polarity output voltages; a first of said areas electrically connected to a first of said voltages and a second of said areas electrically connected to a second of said voltages; temperature indicia means adjacent said rotatable insulating member with said member further having temperature indicating means to provide for the selection of a control temperature for said thermostat by said rotatable member being rotated and said temperature indicating means cooperating with said temperature indicia means; temperature responsive means mounted adjacent said rotatable member and having a rotatable conductive portion that rotates adjacent to said two conductive areas; said conductive areas and said conductive portion of said temperature responsive means creating two differentially variable capacitors; electronic circuit means including connection means connected to said two variable capacitors with said circuit means measuring the unbalance of said capacitors by measuring a capacitive coupled voltage from said alternating current source; and said electronic circuit means having output means indicative of the unbalance of said capacitors.

4,405,081

RAIL FASTENER WITH GAUGE ADJUSTMENT

Carl E. Tack, Elmhurst, Ill., assignor to TransDyne, Inc., Chicago, Ill.

Filed Jan. 21, 1982, Ser. No. 341,305
Int. Cl.³ E01B *9/38, 9/48, 9/66*
U.S. Cl. 238—282 **3 Claims**



1. In a rail securing system wherein the rail has a flanged base resting on a tie between space supports, and a spacer is provided between each support and the rail, and wherein a resilient retainer extends from each support for holding down the fanged base of the rail, the improvement for providing successive changes in the lateral position of the rail relative to the supports, said improvement comprising a set of individual spacers including a plurality of members, said spacers being substitutable for one another between the rail and said supports, with each of said spacers comprising a base located between the support and the base of the rail, and a portion extending from said spacer base overlapping the flanged base of the rail, the thickness of the base of each member being different, and the sum of the thicknesses of any selected pair of spacer bases being constant, said resilient retainer engaging the overlapping portion of said spacer, said overlapping portion having different thicknesses within each set, whereby to provide constant deflection of the resilient retainers regardless of the adjusted position of the flanged rail base.

4,405,082

LOW LEAKAGE FUEL INJECTOR

Richard P. Walter, Southfield, and Robert D. Muller, Royal Oak, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 31, 1981, Ser. No. 288,845
Int. Cl.³ F02M *47/02*
U.S. Cl. 239—91 **11 Claims**

6. A fuel injector comprising:

a housing having a first port that is adapted to receive pressurized fuel from a first source, a second port adapted to be connected to a source of fuel pressurized at a pressure level less than the level of said first source, said housing including a stepped bore having a first bore linked to a narrower second bore and to a wider third bore, said housing further including a first dump orifice situated on said first bore, a second dump orifice situated on said second bore;

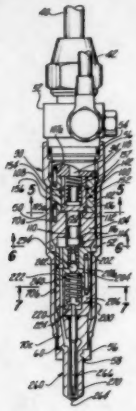
intensifier piston means cooperating with said stepped bore to provide a variable volume upper or primary chamber a middle or inner chamber and a lower or metering chamber;

leakage path means which includes said second dump orifice interposing said middle and said lower chambers and continually maintained at a determinable pressure level less than the pressure developed within said metering

chamber during the injection mode for providing a preferred leakage path for fuel;

said intensifier piston means being responsive to the pressure differential thereacross for reciprocatively moving within said stepped bore, and for selectively uncovering said first dump orifice and said second dump orifice;

nozzle means extending from said housing, and operatively connected, in fluid communication, to said lower chamber, for injecting fuel therefrom in correspondence with the motion of said intensifier piston means;



first fuel passage means for connecting said second port with said lower chamber including first check valve means for inhibiting flow of fuel from the lower chamber to said second port;

second fuel passage means for connecting said middle chamber to said second dump port;

third fuel passage means for connecting said first dump orifice to said second port including second check valve means for inhibiting the flow between said second port and said first dump orifice; and

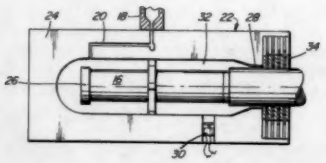
fourth fuel passage means for connecting said first port to said middle chamber.

4,405,083

MOULDING APPARATUS FOR ENCAPSULATING CABLE SPLICES

Leonard J. Charlebois, Kanata, and Fred A. Huszarik, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 19, 1982, Ser. No. 359,899
Int. Cl.³ B29C 6/04
U.S. Cl. 249—97 **3 Claims**



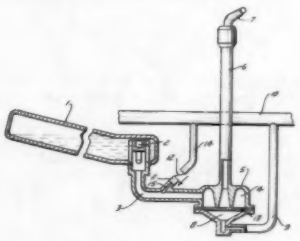
1. A moulding apparatus for moulding encapsulations upon cables comprising at least two mould parts which define a mould cavity and an opening to the cavity for location therein of a cable to extend through the mould and into the cavity, and a resiliently compressible element gripping and sealing device disposed within the opening to seal around said cable and grip it and retain it in fixed position during a moulding operation, said device formed as a diametrically split annulus composed of two structures each of which comprises two groups of planar resilient plates, the plates in one group alternating with those of the other and wherein the plates of one group have semi-circular extensions directed radially inwards of the opening and lying in the plane of its plate, each extension forming a radial rib between plates of the other group, and the ribs of each structure radially in alignment with and sealingly abutting against those of the other structure at the diametral split line to provide annular ribs within the annulus, said ribs being spaced axially along the opening by the plates of the other group of each structure to compressively seal and grip against the cable.

4,405,084

HYDRO-PNEUMATIC ACCUMULATOR FOR IMPULSE SPRINKLING

Vesselin Y. Georgiev, and Vladimir S. Mednikarov, both of Sofia, Bulgaria, assignors to Institute Po Mechanika I Biomechanika, Sofia, Bulgaria

Filed Aug. 21, 1980, Ser. No. 180,381
Claims priority, application Bulgaria, Aug. 21, 1979, 44 712
Int. Cl.³ B05B 1/08
U.S. Cl. 239—99 **4 Claims**



1. Apparatus for impulse spraying, comprising a hydropneumatic accumulator, a connecting pipe having a first end connected to the lowest point of the accumulator, a float valve in the accumulator interposed between the space within the accumulator and the first end of the connecting pipe to prevent the flow of water from the accumulator into the connecting pipe when the water level in the accumulator drops to the predetermined level, a water supplying conduit, conduit means including a pack flow-preventing check valve for feeding water from the water supplying conduit into the accumulator, an outlet pipe having a sprinkler on its outer end, a selectively operated shut-off valve interposed between the second end of the connecting pipe and the inlet end of the outlet pipe, and means responsive to changes of water pressure in the water supplying conduit for controlling the shut-off valve to open the shut-off valve when such water pressure falls below a predetermined desired value, and to close the shut-off valve when such water pressure exceeds a predetermined desired value, the connecting pipe being isolated from the liquid/gas compression accumulator, the upper end of the connecting pipe terminating in a chamber inside which there is affixed the conduit means, the conduit means comprising a cylinder, the cylinder being connected from below, through an inlet, to the water supplying conduit, the water supplying conduit passing through the walls of the chamber, and the conduit means ending at its upper end in a guide cone having a valve seat around an axial opening therethrough, a vertically reciprocable valve element having a stem at its lower end passing through the valve seat, a recess with two opposed apertures in the stem by means of which the valve element is connected to a cross pin through the piston rod of a piston which reciprocates in the cylinder, the diameter of the piston being greater than the diameter of the inlet to the cylinder, at a predeter-

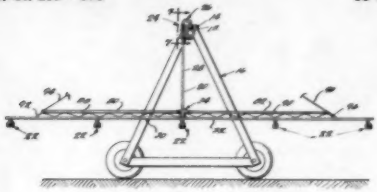
mined distance above the inlet to the cylinder in the walls of the cylinder there being apertures connecting the water supplying conduit with the space in the cylinder beneath the piston.

4,405,085

WATER DISTRIBUTING ASSEMBLY

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Apr. 27, 1981, Ser. No. 257,621
Int. Cl.³ B05B *3/18*
U.S. Cl. 239—178 **11 Claims**



1. A water distributing assembly for use with a section of upwardly bowed rigid conduit having a first axis which extends longitudinally therein, said conduit being supported at the opposite lower ends thereof by wheeled towers to that its longitudinal axis is disposed within a vertical plane for movement over a field in a direction transverse to said vertical plane, said water distributing assembly including

an inverted T-shaped pipe assembly for containing water under pressure, said inverted T-shaped pipe assembly including an elongated head carrying section having a second axis, said head carrying section being arranged to be disposed with said second axis extending horizontally in operation and a mounting section having a third axis, said mounting section being fixed at one end with the central portion of said head carrying section arranged so that said third axis extends vertically upwardly with respect to said second axis,

a plurality of sprinkler heads fixedly mounted in longitudinally spaced relation on said head carrying section in water pressure communicating relation with respect thereto so that water contained within said T-shaped pipe assembly is communicated with said sprinkler heads and discharged therefrom in a plurality of spray patterns within the field therebelow,

clamping means for operatively fixedly connecting the upper end portion of the mounting section with said conduit for the following five adjustable movements; (1) longitudinal movement of said T-shaped pipe assembly along said first axis so as to determine the longitudinal position of operation of the inverted T-shaped pipe assembly with respect to the conduit, (2) pivotal movement of the T-shaped pipe assembly about said first axis so as to position said third axis parallel with said vertical plane, (3) pivotal movement of the T-shaped pipe assembly with respect to the conduit about a fourth axis perpendicular to the aforesaid vertical plane so as to position said third axis within a second vertical plane perpendicular to the first-mentioned vertical plane, (4) vertical translational movement of the T-shaped pipe assembly with respect to the conduit so as to determine the height of operation of the sprinkler heads mounted on the head carrying section thereof above the field surface, and (5) pivotal movement of the T-shaped pipe assembly about said third axis so as to determine the angular extent of said second axis with respect to the first-mentioned vertical plane, and

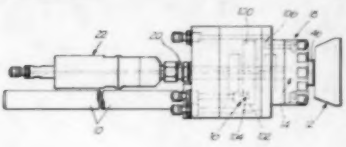
flexible hose means having one end connected with the upper end of the mounting section in fluid pressure communicating relation therewith and an opposite end adapted to be connected with the conduit for communicating water under pressure within said conduit to said T-shaped pipe assembly while accommodating any and all of the aforesaid five adjustable movements.

4,405,086

DEVICE FOR ATOMIZING LIQUID COLOR

Kurt Vetter, Remseck, Fed. Rep. of Germany, assignor to Hans Behr, Stuttgart, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 220,586
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001209
Int. Cl.³ B05B *3/10*
U.S. Cl. 239—224 **9 Claims**



1. A device for the atomizing of liquid color, particularly a lacquer sprayer, having an atomizer bell which is rotatable around a central axial opening and is provided above its rear base with a deflection part of rotational symmetry, the rear side of the center of which is opposite the opening while its radially outer edge is adjacent an overflow surface, the intermediate space between the deflection part and the base being connected in liquid-conducting manner with a free bell space above the overflow surface; and having a nozzle seated on the free end of a coaxial color feed tube, the nozzle extending into the intermediate space and discharging opposite the center of the deflection part, wherein

the deflection part has in its center a cannulae labyrinth comprising a coaxial inlet lying opposite an opening of the nozzle and a coaxial outlet onto the front side of the deflection part; and

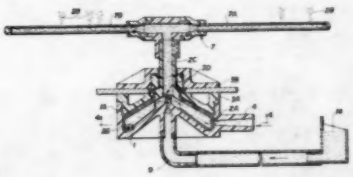
the front side of the deflection part forms an annular coaxial overflow surface for overflow by a partial stream of the color which at an edge of this surface discharges into a main stream of color flowing on an end-side overflow surface of the bell.

4,405,087

FLUID MIXING TECHNIQUE

Antonio Mata-Garza, Jamaica 401, Col. Vista Hermosa, Monterrey, N.L., Mexico

Continuation-in-part of Ser. No. 102,861, Dec. 12, 1979, Pat. No. 4,298,015. This application Jul. 20, 1981, Ser. No. 283,896
Int. Cl.³ B05B *3/04, 7/30*
U.S. Cl. 239—226 **11 Claims**



1. Mixing apparatus comprising in combination, conveying means providing a conduit path for incoming fluid of a first characteristic under pressure converging in a cyclone shaped flow pattern from an input port to an output port comprising a rotary turbine member rotatable by the fluid under pressure in said conduit path, and mixing means providing a second fluid conduit path for conveying a fluid of a second characteristic

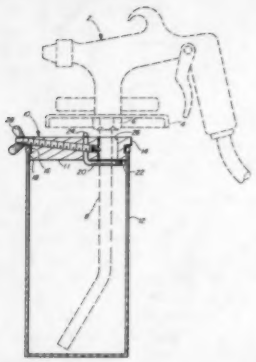
under motive power of the suction provided by the cyclone pattern of the first fluid path at a converging vortex position having an input port for access to a fluid supply external to said cyclone conduit path and an output port located in the converging vortex position of said cyclone path thereby to provide suction for supplying said second fluid into the conveyance path of said first fluid for mixing therewith.

4,405,088

ADAPTOR FOR DISPOSABLE CANS FOR SIPHON-TYPE SPRAY PAINT GUNS

James W. Gray, 4600 N. Bear Canyon Rd., Tucson, Ariz. 85715

Filed Mar. 20, 1981, Ser. No. 245,742
Int. Cl.³ B05B 7/30
U.S. Cl. 239—302 3 Claims



1. An attachment for siphon-type spray paint guns having a siphon tube to utilize disposable open containers holding paint comprising an adaptor adapted to attach to the siphon-type spray paint gun siphon tube and adapted to receive in a securing configuration an associated disposable open container, said adaptor defining a circular shaped disk with a circumferential stepped shoulder, said adaptor adapted to reside in the opening of the associated disposable container with the container opening abutting said stepped shoulder, said adaptor including an opening to receive the siphon tube and means forcibly engaging and holding in place the siphon tube, and means to forcibly engage the side wall of the associated disposable container, said means to engage the side wall of the associated disposable container defines a wire penetrating said adaptor and emerging from both sides thereof, said wire being a handle on one side of the adaptorand an arcuate shaped bow on the other side of the adaptor, said wire pivotal through said adaptor whereby in rotating the handle, the arcuate shaped bow rotates into the wall of the associated disposable container and engages the container and thereby holds the container in place.

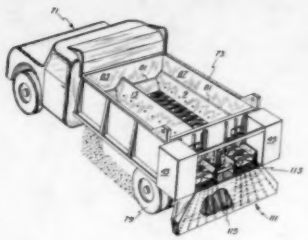
4,405,089

MULTIPLE CONVEYOR

Bruce W. Taylor, Ballston Lake, N.Y., assignor to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,431
Int. Cl.³ A01C 7/06
U.S. Cl. 239—656 9 Claims

1. A self-contained unit insertable in and in combination with a vehicle whose body has front and side walls, said unit being used with said vehicle body's front and side walls, said unit having multiple conveyors for spreading, unloading or dumping therefrom bulk granular material such as salt, sand, grain, fertilizer; said unit having a converging front wall, a vertical rear wall, two converging outside walls, and inverted, V-shaped longitudinal divider means, said vehicle body's front wall forming a continuation of said unit's front wall, and said vehicle body's side walls forming continuations of said units outside walls; said converging-front, vertical-rear and converging-outside walls, and said divider means, together with



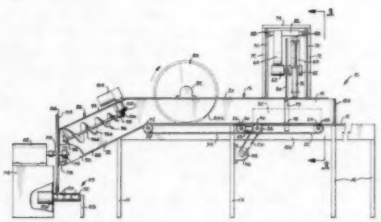
said vehicle body's front and side walls, defining multiple hopper compartments, and each of said hopper compartments having one of said conveyors operatively associated therewith for removing such material.

4,405,090

METHOD AND APPARATUS FOR REDUCING TIRES

Dale Wakeem, Rte. 2, Box 539, Lamar, Mo. 64759

Filed Oct. 6, 1980, Ser. No. 193,904
Int. Cl.³ B02C 19/12
U.S. Cl. 241—3 4 Claims



1. A method of reducing a tire having rubber and metal content, said method comprising the steps of:

conveying the tire along a conveyor path to a first cutting station;

effecting a first pair of cuts through opposite sides of the tire at said first cutting station to cut the tire into a pair of arcuate pieces approximately equal in size without human assistance;

conveying the arcuate pieces from said first cutting station to a second cutting station;

effecting a cut through each of said arcuate pieces at said second cutting station, each cut at said second cutting station being made without human assistance in a direction generally perpendicular to the first pair of cuts and at a location approximately halfway along the arc defined by each arcuate piece, thereby cutting the tire into four pieces approximately equal in size;

conveying the tire pieces from said second cutting station to a grinding station;

grinding each tire piece into small particles of rubber and small particles of metal at said grinding station; and

separating the particles of rubber from the particles of metal.

4,405,091
APPARATUS FOR THE PRODUCTION OF MECHANICAL WOOD PULP

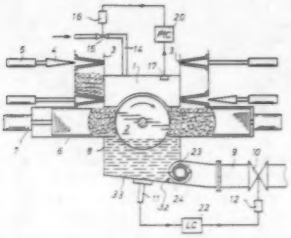
Theodor Bähr; Hans-Otto Heinrich, and Helmut Thumm, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,849

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3015722

Int. Cl.³ B02C *23/38*

U.S. Cl. 241—33 12 Claims



1. In an apparatus for the mechanical production of wood pulp with a grinder located in a housing into which wood stock is fed to be ground up by the grinder for the formation of a slurry of ground wood in a trough below the grinder, the improvement comprising:

a discharge conduit coupled to the trough at a discharge port thereof, said discharge port being located below the upper level of the slurry of ground wood, said conduit further being in unrestricted ground wood flow communication with the slurry of ground wood below the grinder;

a wood chip cutter operatively interposed with the conduit at the trough discharge port; and

means for maintaining the upper level of said slurry of wood pulp above the discharge port.

4,405,092
CUTTING DEVICE

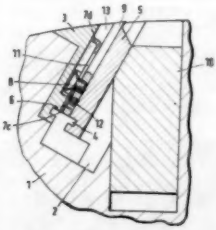
Hans Sybertz; Ferdinand Sybertz, both of Hargesheim, and Arnold Schmidt, Gutenberg, all of Fed. Rep. of Germany, assignors to Hombak Maschinenfabrik GmbH U. Co. KG, Bad Kreuznach, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,408

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 8002428[U]

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—294 14 Claims



1. A cutting device, comprising a rotatable body part having an axis of rotation and a periphery which is provided with a plurality of recesses spaced from one another and has an abutment face in each of said recesses; and a plurality of cutting units each arranged in a respective one of said recesses of said body part, each of said cutting units including a resharpenable cutting member having a front surface, a supporting member which supports said cutting member and is connected with said body part, a member displaceable under the action of centrifugal forces and acting upon said supporting member to clamp the above-mentioned members in the same recess of said body part, a holding member loosely abutting against the abutment face of the same recess of said body part and arranged so that said cutting member is substantially radially displaceably and fixedly held on said holding member and loosely abuts with its front surface against said supporting member, and means for connecting said cutting member with said holding member.

4,405,093
ENDLESS TAPE TRAVELLING DEVICE

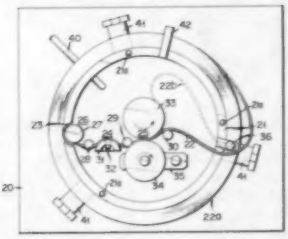
Fumio Izawa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 28,649, Apr. 10, 1979, abandoned, which is a continuation of Ser. No. 865,414, Dec. 29, 1977, abandoned. This application Jul. 28, 1981, Ser. No. 287,820

Claims priority, application Japan, Jul. 27, 1976, 51-89450

Int. Cl.³ B65H *17/48;* G11B *23/10*

U.S. Cl. 242—55.19 R 11 Claims



2. A recording and/or reproducing apparatus which comprises:

a base plate;

a stationary reel mounted on the base plate having an annular body around which an endless tape is wound, and first guide means formed in the annular body to communicate the outer peripheral surface of the annular body to the inner peripheral surface thereof;

a driving mechanism including a capstan and pinch roller which are disposed inside the inner peripheral face of said stationary reel for pulling out said tape wound on said reel through said first guide means such that the tape drawn out from the driving mechanism forms a lossened portion inside the inner peripheral face of said stationary reel;

a recording and/or reproducing head disposed inside the inner peripheral face of said stationary reel and between said first guide means and said driving mechanism for scanning the tape;

second guide means for guiding the tape travelling from said first guide means to said driving mechanism through said recording and/or reproducing head while keeping said tape in a substantially non-twisted relationship with a portion of the tape wound on said stationary reel;

third guide means for guiding the tape passed through said lossened portion to cross over the reel and to the outermost periphery of the tape wound on said reel such that the tape drawn out from said driving mechanism is thereby guided to form a winding path to said outermost periphery of the tape wound on the reel; and

fourth guide means for guiding the tape passed through said driving mechanism and for forming said loosened portion inside the inner peripheral face of said stationary reel wherein the tension of the tape passed through said driving mechanism is less than the tension of the tape between the first guide means and said driving mechanism.

4,405,094
THREAD BRAKE

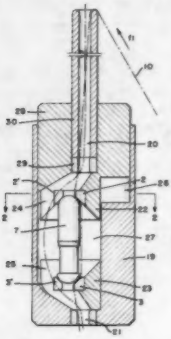
Heinz Scheufeld, Korschenbroich, and Ulrich Lossa, Krefeld, both of Fed. Rep. of Germany, assignors to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,318

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015182; Nov. 5, 1980, 8029436[U]

Int. Cl.³ B65H *59/22*

U.S. Cl. 242—149 **5 Claims**



1. A thread brake interposed between axially aligned thread entry and thread exit passages comprising; a substantially tubular housing, said tubular housing having a capsule-shaped braking cartridge, spaced-apart axially aligned braking surface rings supported in said tubular housing between said thread entry passage and said thread exit passage for retaining said braking cartridge therein, each of said braking surface rings having a threading slot therein through said braking surface ring, said two braking surface rings having a common axis offset radially from said thread entry passage and said thread exit passage whereby a thread guidance passage is formed bypassing the braking region formed by said two braking surface rings and said braking cartridge.

4,405,095
MAGNETIC TAPE SHIFTING DEVICE

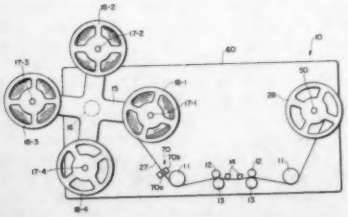
Tsutomu Kohno, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 2, 1981, Ser. No. 280,083

Claims priority, application Japan, Jul. 4, 1980, 55-93653[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—179 **11 Claims**



11. A magnetic tape shifting device for reeling a plurality of magnetic tapes separately wound around a plurality of payoff reels by a plurality of takeup reels, comprising:

(a) first and second slidable members each having a plurality of arms arranged in parallel to each other, each of said arms of said first slidable member being equipped with a reel mount for carrying a payoff reel and with a reel-driving motor for driving said payoff reel, each of said arms of said second slidable member being equipped with a reel mount for carrying a takeup reel and with a reel-driving motor for driving said takeup reel;

(b) first means for linearly moving said first and second slidable members in a direction perpendicular to the plane of said plurality of payoff reels and takeup reels respectively carried by said arms so that a given position of each of said first and second slidable members is moved to a predetermined position with respect to a stationary member of said device, said means having at least one motor operatively connected to said first and second slidable members;

(c) a magnetic tape guiding mechanism for guiding a magnetic tape from one of said plurality of payoff reels to one of said plurality of takeup reels;

(d) second means for detecting the end of said magnetic tape supplied from said payoff reel;

(e) third means for detecting the position of each arm of at least one of said first and second slidable members; and

(f) a control circuit responsive to signals from said second and third means for energizing said motor connected to said first and second slidable members when the end of said magnetic tape is detected and for deenergizing said motor for stopping each of said first and second slidable members at a desired position.

4,405,096
MAGNETIC TAPE CASSETTE

Hans Pössl, Ottenbach, Switzerland, assignor to Wyder AG., Wettingen, Switzerland

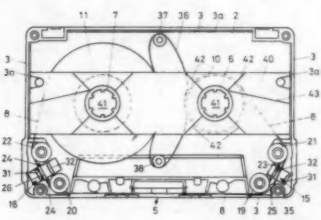
PCT No. PCT/CH80/00095, § 371 Date Apr. 10, 1981, § 102(e) Date Apr. 6, 1981, PCT Pub. No. WO81/00480, PCT Pub. Date Feb. 19, 1981

PCT Filed Aug. 7, 1980, Ser. No. 253,507

Claims priority, application Switzerland, Aug. 10, 1979, 7374/79

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **10 Claims**



1. Magnetic tape cassette, having a housing comprising two shells which encompass a recording and playback zone and in which two reel hubs for winding and unwinding the magnetic tape together with guide pulleys are located on each of the two sides of the recording and playback zone, characterized in that, between the recording or playback zone (**5**) and the reel hubs (**6, 7**), a tape clamp (**25, 26**) of U-shaped cross-section is placed to embrace the magnetic tape (**8**), that limit elements (**19, 20, 3, 35; 19, 57; 73, 74**) opposed to one another for the magnetic tape (**8**) are provided on both sides of the recording and playback zone (**5**), which limit elements, on the one hand, form a passage for the magnetic tape (**8**), and, on the other hand, clamp in and compress the legs of the tape clamps (**25, 26**) in either direction of movement of the magnetic tape thereby to clamp and bind the tape, there being a pair of stops (**23, 24; 61, 62; 81, 82**) for the tape clamps (**25, 26**) positioned between the guide and the associated reel hub to stop movement of the clamp, and that, in the zone between the limit elements (**19, 20, 3, 35; 19, 57; 73, 74**) and the associated reel hub (**6, 7**), a control element (**15, 16; 57; 74**) is provided which can be actuated from outside the housing

to assume either of two operating positions and which, in its first operating position, moves the magnetic tape (8) into the zone of a pair of said stops (23, 24; 61, 62; 81, 82) for the tape clamps (25, 26) and which, in its second position, keeps the magnetic tape (8) away from the stops.

4,405,097

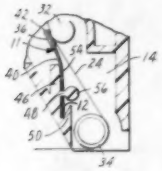
CASSETTE WITH A SLACK LIMITER TAB

Charles D. Gebeke, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 17, 1981, Ser. No. 284,222

Int. Cl.³ G03B *1/04*; G11B *15/32*; B65H *23/08*

U.S. Cl. 242—199 **4 Claims**



1. In a cassette comprising a housing having an access opening; two reels rotatably mounted within the housing; a length of tape having opposite end portions wound around said reels and a portion extending therebetween, means for guiding the tape portion extending between said reels across said access opening and along a relatively tortuous path between one of said reels and said access opening, a flexible resilient slack limiting tab having a contact end portion adapted to engage said tape and an opposite end portion, and mounting means for mounting said opposite end portion on said housing with said contact end portion transversely biased against said tape to press said tape against a support surface along said tortuous path, the improvement wherein:

said opposite end portion comprises a tapered projection having dimensions narrowing from a proximal end to a distal end and said housing comprises rigid walls defining a receptacle having a width intermediate said dimensions of said proximal and distal ends to frictionally receive and compressively hold said projection with said contact end portion in engagement with said tape, said receptacle and projection being included in said mounting means.

4,405,098

EXTENDED PLAY CASSETTE

Barry K. Spicer, Riverside, Calif., assignor to Technicolor, Inc., Los Angeles, Calif.

Filed May 27, 1981, Ser. No. 267,560

Int. Cl.³ G03B *1/04*; G11B *15/32, 23/04*

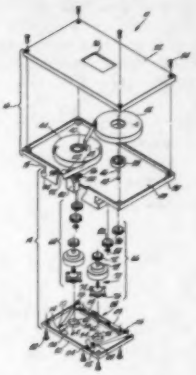
U.S. Cl. 242—200 **8 Claims**

5. An extended play cassette for providing increased web storage capacity for use with an apparatus wherein the apparatus includes a cassette receptacle for receiving a conventional cassette, wherein the conventional cassette includes a housing having hubs therein, the hubs carrying the web, the cassette receptacle being adapted to receive the conventional cassette along an axis substantially perpendicular to a plane defined by the conventional cassette housing, the cassette receptacle including spindles adapted to engage the hubs of the conventional cassette and web handling means for engaging the web, the extended play cassette comprising,

a housing having an adaptor portion substantially similar in form to the housing of a conventional cassette, a magazine portion in stacked relationship with the adapter portion and integral therewith, and an opening between the adapter portion and the magazine portion,

the adapter portion including access means for providing access to the web by the web handling means, engagement means for engaging the spindles, and guide means for guiding the web from the access means through the opening,

the magazine portion including a first and a second hub rotatably carried within the magazine portion, the hubs



adapted to carry the web in rolls thereupon, and guide means for guiding the web from the rolls through the opening to the adapter portion guide means, and

drive means for transmitting rotational motion from the engagement means to the first and second hubs.

4,405,099

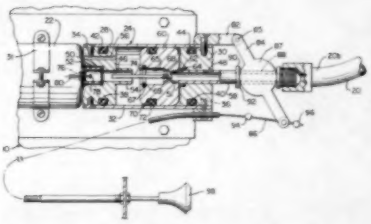
APPARATUS FOR ACTIVATING SYSTEM IN RESPONSE TO IMPACT

Ralph A. Bolea, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio

Filed May 6, 1981, Ser. No. 261,261

Int. Cl.³ B64D *25/00*

U.S. Cl. 244—1 R **23 Claims**



1. An impact apparatus, comprising:

(a) a longitudinal housing having first and second end components, said first end component having a first fluid passage extending therethrough and being adapted to selectively communicate with a source of pressurized fluid;

(b) an inertial member disposed within said housing, said inertial member being reciprocally movable within a predetermined range from one of said first and second end components to the other in response to a time rate of change of velocity of the housing, said inertial member having a second fluid passage extending therethrough in selective fluid communication with said first fluid passage;

(c) an actuator secured to the inertial member, said actuator being extendable into said first fluid passage as the inertial member is moved toward the first end component;

(d) a valve disposed in the first fluid passage for controlling

fluid flow from said source of pressurized fluid, said valve being movable to an open position by the actuator as the inertial member is moved toward the first end component;

(e) a vent passage extending through said housing for exhausting fluid from space between the inertial member and the first end component as the inertial member is moved toward the first end component;

(f) a nipple extending from one of the inertial member and the first end component, said nipple partially defining one of the first and second fluid passages and being sealingly received by the other of the first and second fluid passages; and

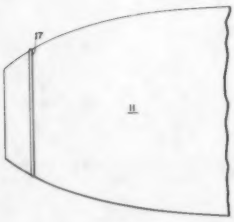
(g) a rigid conduit secured to the inertial member in fluid communication with the second passage, said rigid conduit being reciprocally movable through the second end component as the inertial member moves through the predetermined range.

4,405,100

TURBULENCE GENERATOR FOR MAXIMIZING CONFIGURATION TOLERANCES OF FREE FLIGHT ORDNANCE

Peter Daniels, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,480
Int. Cl.³ F42B *25/20, 13/00*
U.S. Cl. 244—3.1 **1 Claim**



1. A method of reducing the variations in drag disparity between similar free flight ordnance devices caused by variations in surface roughness and configuration so that each of said devices has substantially the same free flight range and accuracy comprising:

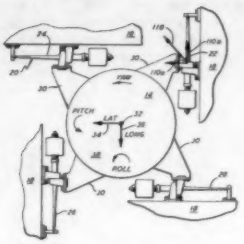
providing each device with a raised annular ring means at the same position on the front end of each device, in the laminar flow of air, where the position is on an essentially curved section of the front end wherein the ring means creates turbulent air flow and the ring means is machined to the same close tolerance dimensions on each device, for causing air flow past the device to change from laminar to turbulent at the same position on each device to reduce surface friction on each of said devices, the surface friction on each device being nearly equal due to the introduction of turbulent flow at the same position on each of said devices, thereby reducing the drag disparity therebetween and providing substantially the same free flight range for all devices.

4,405,101

VIBRATION ISOLATION SYSTEM

Raymond G. Carlson, Orange, and Robert A. Stone, Sandy Hook, both of Conn., assignors to United Technologies Corp., Hartford, Conn.

Filed Oct. 29, 1980, Ser. No. 201,876
Int. Cl.³ B64C *27/04;* **F16F** *7/10*
U.S. Cl. 244—17.27 **15 Claims**



7. A helicopter having mutually perpendicular vertical longitudinal and lateral intersecting axes and including:

a fuselage,

a rotor drive transmission,

a helicopter rotor extending from said transmission and driven thereby,

suspension means supporting said fuselage from said transmission comprising three or more symmetric vibration isolators connecting the transmission and the fuselage so as to permit relative motion therebetween both linearly along and rotationally about each of said axes, to transmit steady state loads therebetween, and to provide vibration force and motion isolation of the fuselage from the transmission linearly along and rotationally about each of said axes when the rotor is generating and transmitting to the transmission vibrations at a predominant frequency,

said symmetric vibration isolators being substantially equally spaced circumferentially about and having axes oriented perpendicular to the vertical axis and lying in the plane of the longitudinal and lateral axes, and

each isolator comprising a shaft member connected to the transmission in slip-fit fashion to provide axial motion of said shaft and said shaft is also connected to the fuselage, and constructed to have a first end which is equally flexible in the direction of the vertical axis and in the common plane of the longitudinal and lateral axes in response to vibration loading of said isolations in transmitting transmission vibrations to the fuselage, and to have a second inertially weighted end deflectable simultaneously with flexing of the first shaft member end under vibratory loading to develop a vibratory node at the point of connection between the transmission and the fuselage when the transmission is vibrating at the predominant frequency and to permit axial motion between the transmission and the fuselage at this point of connection to thereby provide vibration force and motion isolation of the fuselage from the transmission linearly along and rotationally about each of said axes to thereby provide vibration isolation of the fuselage from the transmission in six degrees of freedom.

4,405,102

VARIABLE WING POSITION SUPERSONIC BIPLANE

Robert M. Taylor, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

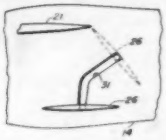
Filed Nov. 20, 1981, Ser. No. 323,525
Int. Cl.³ B64C *3/38, 39/08*
U.S. Cl. 244—45 R **4 Claims**

1. An airplane wing structure attached to an airplane fuse-

lage having a forward end portion and a trailing end portion comprising:

upper and lower elongated wing sections, wherein the leading edge of the upper wing section is positioned on the fuselage forward of the leading edge of the lower wing section, and the upper wing section is supported from the fuselage in a fixed position; and

means supporting the lower wing section from the fuselage to produce rotational and translational displacement of the



lower wing section relative to the upper wing section wherein the lower wing section is capable of assuming configurations where the lower wing section may be aligned with its trailing edge lower than the upper wing section and its leading edge adjacent the trailing edge of the upper wing section for high lift low speed flight conditions, and wherein the lower wing section can be aligned substantially parallel with the upper wing section for higher speed flight conditions.

4,405,103

HYDRAULICALLY OPERATED AIR BORNE ROTOR CRAFT

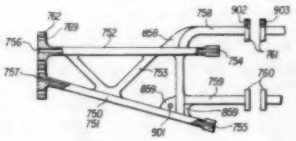
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 954,555, Oct. 25, 1978, Pat. No. 4,358,073, and a continuation-in-part of Ser. No. 800,755, May 26, 1977, abandoned, and Ser. No. 800,489, May 25, 1977, abandoned, said Ser. No. 954,555, is a continuation of Ser. No. 800,756, May 26, 1977, abandoned, which is a continuation of Ser. No. 465,413, Apr. 30, 1974, abandoned, said Ser. No. 800,755, and Ser. No. 800,489, each is a continuation of Ser. No. 465,413,. This application Feb. 13, 1980, Ser. No. 121,186

Claims priority, application Austria, May 4, 1973, 3968/73

Int. Cl.³ B64D *35/00*

U.S. Cl. 244—60 **4 Claims**



1. A fluid pipe structure, consisting of at least three pipes with a capability to pass fluid through said pipes, fastening means on the ends of said pipes and ribs between said pipes,

wherein at least one of said pipes is a pressure fluid delivery pipe and at least one other of said pipes is a fluid-flow return pipe,

wherein said pipes are laterally and vertically distanced from at least one other pipe,

wherein said ribs are provided between some of said pipes to form a rigid structure free of substantial deformations,

wherein first fastening means are provided on one end of said structure means to fasten and carry thereon a hydraulic fluid motor, and,

wherein second fastening means of said fastening means are providing means on the other end of said structure to fasten said structure rigidly to a portion of a vehicle with ability to travel in air,

wherein the interior spaces of said pipes extend through said first and second fasteners,

wherein said pipes are substantially straight pipes which exclude sharp bendings of said pipes to permit the easy passing of a cleaner through said interior spaces of said pipes,

wherein said pipes are provided with arms, which are individually rigidly fastened to a respective pipe of said pipes,

wherein said arms are extending partially slightly laterally away from said pipes to bend thereafter into straight portions which are directed substantially parallel to said pipes, and,

wherein third fastening means are provided on the ends of said arms to fasten said structure to a respective means, whereon said structure shall be held,

whereby said third fastening means are separate of said second fastening means,

whereby said pipes are capable to permit the cleaning of the interiors of said pipes through said first and second fastening means and said pipes permit the fastening of fluid line extensions to said second fastening means without disconnection of said third fastening means.

4,405,104

PANEL BREAKING APPARATUS

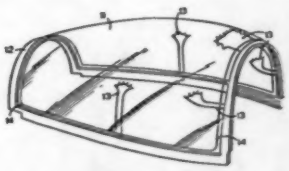
David H. Charman, Horsham; Clara Turner, and Henry W. Turner, both of Ashtead, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 213,082, Dec. 4, 1980, abandoned, which is a continuation of Ser. No. 968,925, Dec. 13, 1978, abandoned. This application Aug. 9, 1982, Ser. No. 406,372

Claims priority, application United Kingdom, Dec. 14, 1977, 52077/77

Int. Cl.³ B64C *1/32*

U.S. Cl. 244—122 AF **6 Claims**



1. In an aircraft, a cockpit canopy made of electrically insulative plastics, and means for fracturing said canopy, said fracturing means being in the form of an electrical circuit associated with a DC power source in said aircarft, said circuit consisting essentially of:

at least one fusible electrical conductor in tape form and consisting of 25%–66% aluminium by weight sheathed in 75%–33% palladium by weight and embedded in and in intimate contact with said canopy with the plane of said at least one conductor substantially normal to the local surface of said canopy;

a power booster consisting essentially of an inductance electrically connected to said at least one conductor and operative to provide power both to explode said at least one conductor and to initiate a violent exothermic alloying between said palladium and said aluminium and thus to fracture said canopy by generating a crack therein along said conductor; and

switch means electrically connected to said at least one conductor and operative to permit a surge of electrical energy from said DC power source to said inductance.

4,405,105
AIRFOIL FLAP ACTUATION

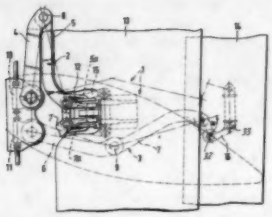
Hommayoun Dilmaghani, Gessel; Hugo Sgarz, Bremen-Lesum, and Hartmut Schulz, Bremen, all of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 6, 1981, Ser. No. 250,931

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013774

Int. Cl.³ B64C *3/38, 9/20*

U.S. Cl. 244—213 **13 Claims**



1. In an airfoil, a flap, an actuating mechanism for moving the flap, comprising:

two pantograph guide systems each being pivotally secured to the airfoil at points spaced along the span of the airfoil, each guide system having two branches pivotally linked to a head, there being two heads accordingly;

means for each of the guide systems, for pivotally linking respectively the heads to the flap for pivoting on approximately horizontal axes, the axes extending transversely to a direction of the flap movement, said means for respectively pivotally linking the heads to the flap including essentially vertical pins accordingly, one of the pins positively permitting lateral play to a larger extent than the other pin;

two control rods for each of the guide systems respectively extending from the two branches of the respective guide system and being pivotally linked thereto as well as pivotally linked to the flap at points in each instance being spaced from the respective one of said axes so that, upon expansion of the guide link for extension of the flap, the flap is pivotally actuated for pivoting on said horizontal axes; and

drive means connected for extending and retracting the guide systems.

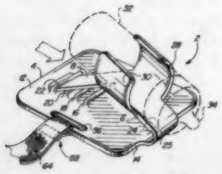
4,405,106
BABY BOTTLE HOLDER

Teri A. Adler, 6027 E. Calle del Norte, Scottsdale, Ariz. 85251

Filed Jun. 4, 1982, Ser. No. 385,022

Int. Cl.³ A61J *9/06*

U.S. Cl. 248—102 **7 Claims**



1. A baby bottle holder for assisting an infant during feedings and for limiting the amount of liquid that the infant can consume from a baby bottle during a feeding interval, said baby bottle holder comprising in combination:

a. a base portion including a lower surface for resting upon the chest of an infant, said base portion including a forwardmost edge normally disposed toward the infant's head, said base portion further including an upper surface opposite said lower surface, said upper surface presenting a plurality of engagement means spaced at varying distances from the forwardmost edge of said base portion;

b. a bottle holding member having front and rear ends and having a clamp disposed therebetween for releasably engaging a baby bottle, the front end of said bottle holding member being hingedly coupled to the forwardmost edge of said base portion for allowing said bottle holding member to be pivoted with respect to said base portion for varying the angular position of the baby bottle engaged by said clamp; and

c. a prop member having upper and lower ends, the upper end of said prop member being hingedly coupled to said bottle holding member proximate the rear end thereof, and the lower end of said prop member being adapted to releasably engage one of said plurality of engagement means to selectively position the lower end of said prop member relative to the forwardmost edge of said base portion and to thereby adjust the angular position of the baby bottle engaged by said clamp.

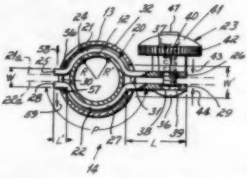
4,405,107
CLAMP SYSTEM FOR TELESCOPING TUBES

C. Wayne Clyburn, Cincinnati, Ohio, assignor to Hamilton Stands, Incorporated, Monroe, Ohio

Filed Jun. 23, 1982, Ser. No. 391,176

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—122 **18 Claims**



1. A clamp system to clamp inner and outer telescoping tubes in a desired position relative one to the other, said clamp system comprising

structure defining at least one port in said outer tube, said port being positioned between the ends of said outer tube,

at least one clamp part disposed interiorly of said outer tube and exteriorly of said inner tube, said clamp part being movable into and out of clamping position relative to said inner tube, said clamp part extending outwardly through said port in said outer tube, and,

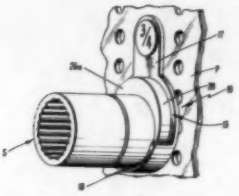
a fastener connected exteriorly of said outer tube with said clamp part, said fastener cooperating with said clamp part for selectively tightening and releasing said clamp part against said inner tube, longitudinal movement of said inner tube relative to said outer tube being limited when said clamp part is tightened against said inner tube due to interference of said clamp part with said outer tube's port structure, and longitudinal movement of said inner tube relative to said outer tube and said clamp part being permitted when said clamp part is released from tightened position against said inner tube.

4,405,108

MAGNETIC TOOL RETAINING DEVICE

Walter B. Muirhead, Rte. 3, Box 260, Jasper, Tenn. 37437

Filed Apr. 27, 1981, Ser. No. 257,905
Int. Cl.³ F16B 47/00
U.S. Cl. 248—206 A **6 Claims**



1. A device for retaining a ferrous metal tool, such as a wrench, socket or the like for easy access on an upright surface, comprising:

a holder having a front mounting surface and rear attachment surface;

a mounting post projecting outwardly from said front mounting surface and including resilient and thread like ridges extending substantially around an outer surface of said mounting post and further including a central opening extending through said holder thereby enabling mounting of said device to a solid surface with a flat head screw or the like received through the central opening; and

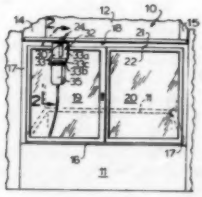
a magnet including a hole having an interference fit diameter receiving said mounting post, thereby enabling said magnet to be positioned upon said mounting post; said magnet having a mounting face projecting outwardly from the holder and having sufficient exposed magnetic area to attract and retain said tool; said mounting face also having a sufficiently free edge whereby said tool may be securely held on said face while allowing removal by lateral sliding movement across the edge and from said face.

4,405,109

PORTABLE BATHROOM HANGERS FOR HYGIENIC IRRIGATION EQUIPMENT

Merle A. Murdoch, Rte. #1, Box 194-K, Shelby, N.C. 28150

Filed Sep. 8, 1981, Ser. No. 300,045
Int. Cl.³ E04G 3/00
U.S. Cl. 248—215 **1 Claim**



1. In a bath compartment having a door opening (16) spanned by an elevated horizontally disposed rail (18), a portable hygienic irrigation device (32) including a reservoir (35), and means carried by said rail for suspending said device comprising

an inverted U-shaped hanger (24) detachably fixed to said rail;

one leg of said hanger consisting of a flat bar (28, 28*a*) depending adjacently parallel to the plane of said opening (16),

said irrigation device (32) consisting of an L-shaped unitary frame having a flat vertically disposed flange (33*a*) and a horizontally disposed flange (33*b*);

pivot means (34*a*, 34*b*) for oscillatably suspending the vertical flange (33*a*) of said frame upon said pivot means (30) and face-to-face with said depending bar (28, 28*a*) to thereby suspend the device for oscillation parallel to the plane of said opening and

means including said horizontal flange (33*b*) for cantilevering said reservoir (35) axially outwardly from said pivot means (30) and from the plane of said opening,

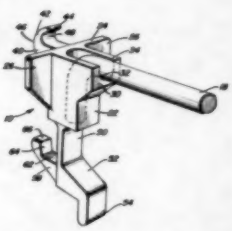
said last-named means being responsive to a lateral stress component of the weight of said reservoir for biasing said vertical flange (33*b*) in face-to-face frictional engagement with said depending bar (28, 28*a*) whereby the amplitude of oscillation of said device is lessened.

4,405,110

FIXTURE FOR PERFORATED BOARD

Alfred M. Gibbons, Dallas, Tex., assignor to Kanmark, Inc., Chanute, Kans.

Filed Feb. 24, 1982, Ser. No. 352,031
Int. Cl.³ B61L 5/00
U.S. Cl. 248—221.2 **9 Claims**



1. A bracket for supporting an article hanger from a perforated panel having vertically spaced and aligned apertures, said bracket comprising a body of unitary construction of plastic material have resilient characteristics, said body having a rear surface engageable with the panel, a top lug projecting from the rear face of the body and extendible through an aperture in the panel, a bottom lug aligned with the top lug and projecting from the body and extendible through a lower aperture in the panel, at least one of said lugs including means engaging the rear surface of the panel and exerting a forward gripping force thereon to securely mount the bracket on the panel, said body including a flexible resilient web portion supporting the bottom lug to enable arcuate swinging movement thereof to facilitate insertion of and removal of the bottom lug in relation to the lower aperture.

4,405,111

INTERJOIST SUPPORT

Thomas C. Lennon, 1473 Pecan Tree Dr., Germantown, Tenn. 38138

Filed Apr. 22, 1981, Ser. No. 256,545
Int. Cl.³ F16M 13/00
U.S. Cl. 248—544 **5 Claims**

1. An extensible support for spaning between spaced joists,

studs and the like elements having opposed surfaces, which comprises:

outer and inner telescopically extensible rod-like members having internal and external threads, respectively, threadedly engaging one another and each having a free outer end portion with threaded lag screw means affixed thereon for screwing into one of said elements,

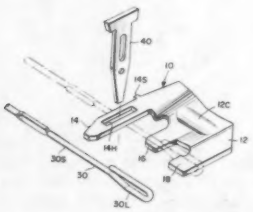
the pitch angles of the threads on said members and said lag screw means being such that rotation of either of said members relative to the other in a direction such as to extend said support rotates the lag screw means thereon in that direction which screws the lag screw means thereon into an element.

4,405,112

GANG FORM BOLT

Max Doubleday, Caldwell, and Anthony J. Gallis, Lake Hiawatha, both of N.J., assignors to Harsco Corporation, Camp Hill, Pa.

Filed Apr. 9, 1982, Ser. No. 367,108
Int. Cl.³ E04G *17/00*
U.S. Cl. 249—207 **15 Claims**



1. A device having at least a tie rod holding bolt for holding a tie rod passing through abutting frames of prefabricated panel units and keeping gang form sections in place, the frames having mating slots, the tie holding bolt comprising:

a body portion;

a slot leg extending from a first end of said body portion for entry through the mating slots;

a tie rod engaging leg extending from a second end, opposite said first end, of said body portion, said tie rod engaging leg extending parallel to said slot leg and in the same direction as said slot leg;

a middle leg extending from said body portion, spaced from and between said slot leg and said tie rod engaging leg and extending in the same direction as said slot leg and sid tie rod engaging leg; and wherein said tie rod engaging leg lies in a substantially horizontal plane, and said slot leg and said middle leg are both outside of said substantially horizontal plane of said tie rod engaging leg, and said middle leg and said slot leg are adapted to straddle a tie rod engaged to said tie rod engaging leg with said middle leg abutting the frames, wherein

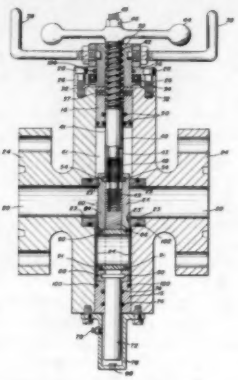
said slot leg and said middle leg are disposed on opposite sides of said substantially horizontal plane of said tie rod engaging leg, and wherein said tie holding bolt is adapted to resist tipping by the resistance of a tie rod from bending a straight portion of the tie rod.

4,405,113

RECIPROCATING EXPANDABLE GATE VALVE

Robert L. Erwin, deceased, late of Farmington, N. Mex., and by Josiephine Reed Erwin, executrix, 1702 N. Mesa Verde, Farmington, N. Mex. 87401, assignors to Josiephine Reed Erwin, Farmington, N. Mex.

Filed May 11, 1981, Ser. No. 262,791
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—168 **22 Claims**



1. A gate type valve unit comprising:

a valve body including first and second aligned flow passageways having facing spaced end portions separated by a transverse gate chamber;

a gate mounted for reciprocation along a gate path of movement in said gate chamber between a closed position blocking said spaced end portions from communication with each other and an open position permitting communication of said end portions, said gate including:

first and second seal blocks mounted for movement transversely with respect to said gate path of movement toward and away from said facing spaced end portions of said flow passageways when said gate is in its closed position;

a central gate block positioned between said first and second seal blocks;

a gate conduit extending through said gate and aligned with said facing end portions of said flow passageways when said gate is in its open position for permitting flow from one of said flow passageways through said gate conduit to the other of said flow passageways, said gate conduit being slidably and sealingly mounted in each said seal block thereby permitting said transverse movement of each said seal block when said gate is in its closed position; and camming means internally of said gate for moving said first and second seal blocks toward said facing end surfaces of said flow passageways to effect sealing contact therewith;

main stem means connected on one end to said gate and mounted for reciprocation in said valve body for effecting movement of said gate between its closed position and its open position; and

cam drive means mounted for axial movement relative to said main stem means for actuating said camming means, said cam drive means comprising a cam drive shaft having a first thread section threadably mounted in said main stem means for effecting axial movement of said cam drive shaft relative to said main stem in response to rotation of said cam drive shaft, and said gate additionally including connector means between said main stem and said seal blocks precluding relative movement of the seal blocks in the direction of the axis of the main stem while permitting relative movement perpendicular to the axis of the main

stem and wherein said camming means comprises first and second cam means extending along vertical side edges of first and second faces of said central gate block facing said seal blocks and having a threaded aperture in which one end of said cam drive shaft is threadably received so that rotation of said cam drive shaft effects movement of said central gate block relative to said seal blocks in a direction parallel to the axis of the main stem and wherein said seal blocks each include first and second cam means extending along vertical side edges thereof drivingly engaged with the cam means of the central gate block.

4,405,114

JACK FOR TENSIONING CABLES IN PRESTRESSED CONCRETE STRUCTURES

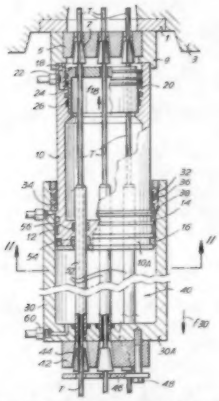
Romualdo Macchi, Via S. Paolo 31, Pisa, Italy

Filed May 29, 1981, Ser. No. 268,157

Claims priority, application Italy, Jun. 12, 1980, 9464 A/80

Int. Cl.³ E21B *19/00*

U.S. Cl. 254—29 A **7 Claims**



1. Jack for tensioning a plurality of individual linear tensioning means in the form of individual cables made up of sheathed strands, wires, rods or the like, for prestressing concrete structures containing such linear tensioning means and which linear tensioning means individually extend outwardly from the corresponding concrete structure through a distribution plate for anchoring to anchoring head means thereat, comprising a cylinder-piston system including a cylinder member and a piston member, such two members forming a variable volume chamber therebetween and being arranged for relative slidable movement toward and away from each other to extend and retract the jack, one of the members being arranged as an adjacent member for acting operatively against such distribution plate and the other of the members being arranged as a remote member for engaging operatively such plurality of linear tensioning means which extend outwardly through the distribution plate to tension the linear tensioning means upon relative movement of the members away from each other to extend the jack, the cylinder member having a closed end provided with a centrally unobstructed cylinder end wall extending continuously thereacross and an open end for slidably operatively receiving the piston member, and the piston member having a centrally unobstructed end face extending continuously thereacross and forming a corresponding centrally unobstructed continuous piston working surface disposed in opposed facing relation to the cylinder end wall and being relatively movable toward and away from the cylinder end wall to vary the volume of the chamber between the members as the members move relatively toward and away from each other to retract and extend the jack and constituting the piston working surface used for extending the jack to tension the linear tensioning means, and a plurality of individual guide pipes arranged in spaced apart relation and individually operatively extending correspondingly through the cylinder end wall, the chamber and the piston end face in any position of relative movement of the members and being operatively mounted on one of the members and slidably arranged relative to the other member, for operatively individually receiving a corresponding linear tensioning means therethrough from the distribution plate for operative engagement with the remote member.

4,405,115

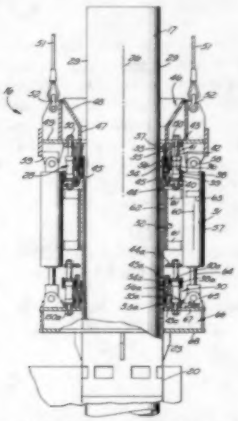
GRIPPING JACK SYSTEM

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Feb. 20, 1981, Ser. No. 236,298

Int. Cl.³ B66F *1/08*

U.S. Cl. 254—106 **15 Claims**



1. The combination comprising first and second members, and jacking mechanism for moving said members along an axis relative to one another, said jacking mechanism comprising:

two structures which are relatively axially movable and transmit force in opposite directions to said two members respectively; and

power operated means for moving said two structures axially relative to one another and thereby jacking said two members axially relative to one another;

one of said structures including a slip bowl adapted to be urged axially by said power actuated means, and at least one slip engaging said bowl in a relation to be cammed thereby against said first member in gripping relation;

said second member having a portion extending to a location at which it can apply axial force to said slip in a grip tightening direction upon relative axial actuation of said members by said power operated means.

4,405,116

ADJUSTABLE PEDESTAL TRESTLE FOR THEATER STAGES OR THE LIKE

Hans-Jochen Eisenberg, Triebelsheide 59, 5600 Wuppertal 1, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,806

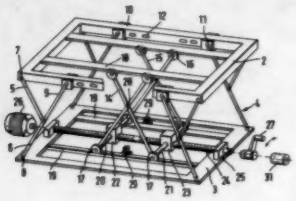
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003392

Int. Cl.³ B66F *3/22*

U.S. Cl. 254—122 **18 Claims**

1. An adjustable pedestal trestle comprising a top frame

means, a platform carried by said top frame means, and four supporting scissors means each having at least three legs, one leg of each of said four supporting scissors means is connected to a corner area of the top frame means for supporting the platform equally in a raised in-use position, characterized in that means are provided for vertically lifting the platform including at least one lifting scissors means arranged centrally below the platform within an area defined between the four



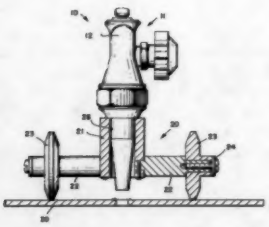
supporting scissors means, said lifting scissors means being extensible in a direction toward and away from an underside of the platform, in that means are provided for locking the supporting scissors means in an adjusted raised in-use position so as to enable the lifting scissors means to be moved in a direction away from the underside of the platform in the raised in-use position, and in that means are provided for driving the lifting scissors means.

4,405,117

GUIDING ATTACHMENT FOR A CUTTING TORCH

Raymond O. Ohlaug, 23033 Oxnard St., Woodland Hills, Calif. 91367

Filed Sep. 28, 1981, Ser. No. 305,973
Int. Cl.³ B23K 7/10
U.S. Cl. 266—66 **2 Claims**



1. A guiding attachment for use in combination with a cutting torch including:

a. a nozzle having a truncated conical tip portion and a cylindrical portion;

b. an elongated member mechanically coupled to the nozzle;

c. gas supplying means for supplying gas to the nozzle mechanically coupled to the elongated member; and

d. a handle mechanically coupled to the elongated member, said guiding attachment comprising:

a. a cylindrical member having a bore into which the nozzle is placed;

b. a pair of metal axial rods mechanically coupled to said cylindrical body;

b. a pair of metal wheels, each of which is rotatably coupled to one of said metal axial rods; and

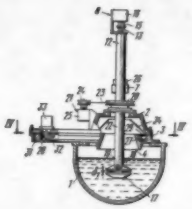
c. coupling means for coupling the cylinidrical portion of the nozzle of the cutting torch to said cylindrical member.

4,405,118

APPARATUS FOR REFINING MOLTEN METALS FROM INSOLUBLE IMPURITIES

Valentin I. Belsky, ulitsa Petukhova, 68, kv. 61; Serafim N. Suturin, ulitsa Kozhevnikova, 2, kv. 22; Gennady I. Orlov, ulitsa Vatutina, 27, kv. 20; Anatoly V. Dolgov, Morskoi prospekt, 36, kv. 30; Boris K. Goncharov, ulitsa Zorge, 105, kv. 38; Vladimir I. Antonov, ulitsa Petukhova, 26, kv. 47, and Jury A. Naryshkin, ulitsa Biljukhera, 7, kv. 55, all of Novosibirsk, U.S.S.R.

Filed Jan. 21, 1982, Ser. No. 341,506
Int. Cl.³ C22B 9/02
U.S. Cl. 266—227 **5 Claims**



1. Apparatus for refining molten metals from insoluble impurities, comprising:

a housing associated with a removable base in which an opening is formed;

an elongate filtering device mounted on said housing and passing through said opening formed in said base;

a filtering member mounted on an end region of said filtering device;

means mounted on said housing for rotating said filtering member about an axis of rotation;

means mounted on said housing for longitudinally reciprocating said filtering member over a path of travel which passes through said opening formed in said base;

a trough formed in said removable base of said housing, said trough forming a closed loop and extending around said opening formed in said base through which said filtering member passes; and

means situated within said closed-loop trough for engaging and removing impurities from said apparatus which are discharged from said filtering member into the closed-loop trough.

4,405,119

OLEOPNEUMATIC SUSPENSION WITH VARIABLE THROTTLE ORIFICES, ESPECIALLY FOR AIRCRAFT LANDING GEAR

Jean Masclet, Paris, and Andre Turiot, Morsang S/Orge, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Continuation of Ser. No. 968,471, Dec. 11, 1978, abandoned. This application Jul. 22, 1981, Ser. No. 285,790
Claims priority, application France, Dec. 12, 1977, 77 37408
Int. Cl.³ F16F 9/342
U.S. Cl. 267—64.22 **12 Claims**

1. An oleopneumatic suspension, comprising:

two hollow movable members which are movable relatively to each other, one of said movable members being movable within said other of said movable members;

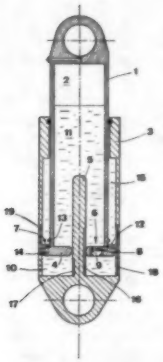
piston means operatively intercoupled between said two movable members, said piston means having an equilibrium position, said piston means together with said one movable member separating the other of the two hollow members into at least first, second and third variable volume chambers, the volume of said second and said third chambers being variable and in opposition to each other,

said three chambers each containing hydraulic liquid, said piston means having its face in contact with said liquid;

said one movable member including a hollow rod having one end enclosing a pneumatic spring and the other end fixed to said piston means, and said other movable member being a cylinder;

a guide rod fixed with a base of said other of said movable members;

said piston means comprising a first valve having an opening and including first throttle means between said first chamber and said second chamber, said first throttle means being oriented for providing for free flow in a first direction of the hydraulic liquid from said first chamber to said second chamber through said first valve and throttling the hydraulic liquid passing during its flow from said second chamber to said first chamber through said piston means, and a second valve having an opening and including second throttle means between said second chamber and said third chamber, said second throttling means being oriented for providing for free flow in a second direction of the hydraulic liquid opposite to said first direction from said second chamber to said third chamber and throttling the flow of the hydraulic liquid passing during its flow from said third chamber to said second chamber through said piston means;



said first throttling means cooperating with the opening of said first valve to provide throttling in a compression phase of said two hollow movable members and said second throttling means cooperating with the opening of said second valve to provide throttling in an extension phase of said two hollow movable members;

said first throttling means including a first throttling orifice cooperating with said first valve opening, and said second throttling means including a second throttling orifice cooperating with said second valve opening, said first throttling orifice having a cross-sectional opening greater than the cross-sectional opening of said second throttling orifice;

by-pass groove means, including one by-pass means in said second chamber and another by-pass means in said third chamber and each of said by-pass means having a portion beginning substantially proximate to said piston means when in its said equilibrium position;

said by-pass groove means including a pair of grooves in the outer face of said guide rod, one of said pair of grooves being longer than the other, said longer groove extending past said piston means and connecting said first and said second chambers when said piston means is in said neutral postion, and said one of said two by-pass grooves being shorter and being only in said second chamber in said equilibrium position; and

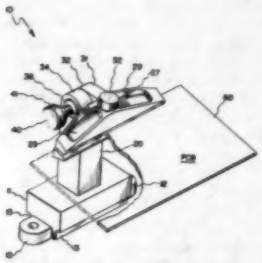
each of said grooves having an effective section which varies in dependence on the position and the direction of displacement of said piston means in the outer of said two hollow movable members so that over at least one predetermined distance on both sides of said equilibrium position of said piston means, under load or in the absence of an external load being applied, said first and said second grooves which provide throttling in the compression and extension phases have cross-sections which are respectively greater than those of said first throttling orifice ensuring throttling in the compression phase and said second throttling orifice ensuring throttling in the extension phase for the remainder of the distance which said piston means moves.

4,405,120

PRINTED CIRCUIT BOARD HOLDER

Marvin Kober, Spring Valley, N.Y., assignor to O.K. Machine and Tool Corporation, New York, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,971
Int. Cl.³ B25B 1/04
U.S. Cl. 269—71 **8 Claims**

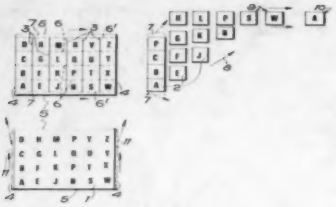


1. A printed circuit board holder comprising a base member having mounting means comprising means including a bottom surface for supporting the base member on a work surface and means adapted for clamping the base member in a vise, an upwardly-extending support member rotatably mounted on the base member and rotatable over a full 360° in a horizontal plane, said rotatable mounting comprising a fixed post on one of the support member and the base member, and a bored member for receiving and frictionally engaging the fixed post on the other of the support member and base member, said post being resilient and having a slightly outwardly tapered slotted end and a substantially annular protuberance thereon, and the bored member having an annular recessed section for receiving the annular protuberance on the tapered end of the post when the latter engages the bore on the bored member in a frictionally-engaging relationship, thereby allowing the full 360° rotation of the support member about the base member while permitting the support member to firmly hold any set position without the need for external clamping, a board holding member pivotably mounted on the end of the rotatable support member and having spring-biased opposed jaws for receiving and clamping an extended edge portion of a printed circuit board, means for adjusting the spring biasing of the opposed board receiving jaws, and means for holding the pivotable mounting of the board holding member in a selected pivotable position, said pivotable mounting being configured to allow pivoting of the clamped board in a vertical plane over an angle exceeding 180°.

4,405,121
CUTTING AND COLLATING SHEETS OF PAPER, CARD, ETC.

James Hill, 116 Silverdale Rd., Sheffield S11 9JL, England

Filed Sep. 8, 1981, Ser. No. 299,847
Claims priority, application United Kingdom, Sep. 5, 1980, 8028794
Int. Cl.³ B65H 39/06
U.S. Cl. 270—58 12 Claims

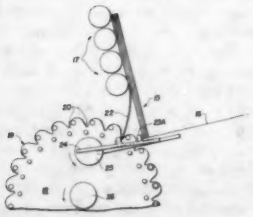


1. A method of cutting a discrete rectangular sheet into a plurality of pieces in a plurality of rows and collating all the cut pieces comprising first forming a plurality of slits extending in spaced relationship parallel to a first pair of opposite edges of the sheet, with all the slits ending short of at least one of the other pair of opposite edges of the sheet, to form at least one continuous extending, uncut edge portion, said slits dividing the sheet into separate, elongated strips attached together by the uncut edge portion, next cutting along a plurality of lines parallel to that other pair of opposite edges and with at least one of the lines of cut intersecting the ends of the slits adjacent the at least one uncut edge portion to separate said at least one uncut edge portion from said strips, then feeding the pieces in the lengthwise direction of the uncut edge portion left beyond the respective ends of the cut ends of the slits and allowing said uncut edge portion to fall away, thereafter allowing the pieces at one end of the rows perpendicular to the direction of feed to drop to a level below the remaining pieces, transversely feeding the remaining pieces towards the dropped pieces, and superimposing the remaining pieces in the respective rows in order on to the respective previously dropped pieces, and finally allowing the batches of pieces to fall successively on to a substantially stationary support, whereby a stack of the pieces is formed in definite order.

4,405,122
HIGH SPEED FEEDING AND TRANSPORT OF PAPER SHEET PRODUCTS

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Filed Jun. 5, 1981, Ser. No. 270,827
Int. Cl.³ B65H 5/10
U.S. Cl. 271—8 A 15 Claims

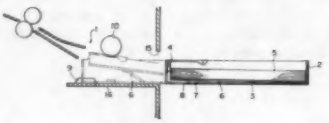


1. The method of feeding and transporting paper sheet products comprising the steps of, stacking the paper sheet products against a stop to form a stack, bending away from the stack individually one at a time one edge of a sequence of single paper sheet products held in place by the stop, seating firmly a plurality of the products in the stack against said stop against a metered gage separating a plurality of sequential products a predetermined distance, grasping the edge of the single paper sheet product when bent away from the stack and seated in the gage, and pulling a plurality of the grasped paper sheet products from the stack in a substantially shingled array for transport away from the stack.

4,405,123
AUTOMATIC PAPER SHEET FEEDING DEVICE FOR COPYING MACHINE

Kokichi Takeyama; Kiyoshi Sugawara, and Yasuyuki Fukagawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,704
Claims priority, application Japan, Oct. 21, 1980, 55-146248
Int. Cl.³ B65H 3/30
U.S. Cl. 271—22 4 Claims



1. An automatic paper sheet feeding device for a copying machine having a stack of paper sheets mounted on a base plate in a cassette, the plate being biased rotatively upwardly by a spring so that an uppermost paper sheet of the stack is in contact with a feeding roll to feed the paper sheets to the copying machine one by one with a rotation of the feeding roll, comprising:

a magnet fixedly secured on a bottom surface of the cassette, the magnet holding the base plate in parallel with the bottom surface of the cassette against the spring force when the base plate is close to the magnet;

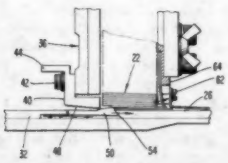
a slot formed in a front portion of the cassette; and

a cam member, the cam member being able to enter into the slot when the cassette is inserted into the automatic paper sheet feeding device and being engageable with a front edge of the base plate to release the base plate from the magnetic holding force of the magnet to allow the base plate to rotatingly move upwardly by the force of the spring.

4,405,124
TAG FEED MECHANISM

Michitoshi Watanabe, Nagoya, Japan, assignor to Tomoe Special Machine Co., Ltd., Nagoya, Japan

Filed Dec. 17, 1981, Ser. No. 331,784
Int. Cl.³ B65H 3/24
U.S. Cl. 271—135 15 Claims



1. A tag feed mechanism for feeding tags one at a time from a stacked tag supply to a tag attaching station, comprising:

a base;

a tag push member slidably disposed on said base for engag-

ing and moving a tag from the tag supply to the tag attaching station;

a pusher element resiliently coupled to the distal end of said tag push member; and

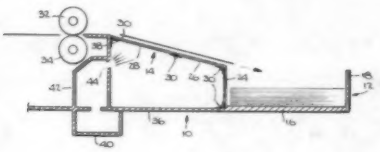
a shutter element disposed upstream of the stacked tag supply and having a bottom surface disposed at a distance above said base equal to the thickness of an individual tag in said stacked tag supply, the bottom surface of said shutter element cooperating with said pusher element for displacing said pusher element from a rest position to a tag pickup position as said tag push member moves from the tag supply to the tag attaching station, whereby only a single tag is moved out of the stacked tag supply.

4,405,125

PAPER STACKING DEVICE

Walter J. Kulpa, Norwalk, and John R. Paulik, Newtown, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 14, 1981, Ser. No. 301,719
Int. Cl.³ B65H *29/24*
U.S. Cl. 271—195 **2 Claims**



1. A levitating paper stacking device for stacking different length papers, comprising:

a box-like receptacle having a bottom wall, a front wall, and a pair of sidewalls;

a fold-down, four bar linkage, perforated ramp, said ramp being movable between a raised position for stacking a shorter length paper and a stored position for stacking a longer length paper, said ramp having three hinged segments wherein the forwardmost segment constitutes the rear wall of the receptacle when said ramp is in its raised position and wherein the forwardmost and middle segments constitute an addition to the bottom wall of the receptacle when the ramp is in its stored position; and

means for directing a levitating air flow toward the rearwardmost segment of said ramp, wherein said airflow impinges on said rearwardmost segment when said rearwardmost segment is in its raised and stored positions, whereby the different lengths papers are conveyed to the front wall of the box-like receptacle with a minimum of bounceback.

4,405,126

AIR REJECT GATE

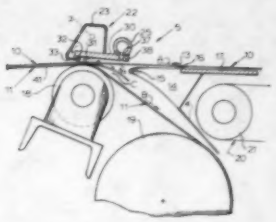
Kenneth G. Frye, South Egremont; Donald R. Grody, Pittsfield, and Gerald A. Guild, Dalton, all of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Jan. 26, 1981, Ser. No. 228,260
Int. Cl.³ B65H *29/62*
U.S. Cl. 271—279 **5 Claims**

1. A gate apparatus for use in a sheet transfer mechanism in which a seriatim flow of sheets is conducted there-through along a generally lateral main path by virtue of at least upper surface engagement with a laterally running transport tape means, said apparatus comprising:

at least one branch path leading downwardly and away from said main path and defined by a downwardly running transport tape means adapted for undersurface engagement with said sheets, and

a control mechanism overlying said main and branch paths for directing each sheet along either said main or said branch paths comprising a first low pressure means for discharging from a first manifold a continuous first fluid flow laterally and parallel across the upper surface of said sheet for causing atmospheric air pressure beneath said sheet to force said sheet upper surface into driving engagement with said laterally running transport tape means and maintain said sheet in said main path and a second high pressure means for intermittently discharging from a second manifold a second fluid flow downwardly against



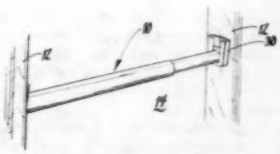
the upper surface of said sheet to deflect said sheet out of driving engagement with said laterally running transport tape means and into said branch path for driving engagement with said downwardly running transport tape means, said first and second manifolds being consecutively disposed on a mounting base with said first manifold upstream of said second manifold, said mounting base being pivotable about a bar extending through said first manifold.

4,405,127

DOORWAY MOUNTED HORIZONTAL BAR

Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Inc., Pasadena, Calif.

Filed May 10, 1982, Ser. No. 376,513
Int. Cl.³ A63B *1/00*
U.S. Cl. 272—62 **8 Claims**



1. A doorway mounted horizontal bar comprising,

a pair of telescoping tube members,

end plates rigidly attached at opposite ends of said tube members, said end plates vertically arranged and having opposite side edges tapering downwardly and laterally inwardly,

mounting brackets adapted to be secured to opposite sides of the doorway supporting said end plates, said mounting brackets each having inner and outer parallel walls interconnected by laterally disposed end walls and forming a passageway open at the top and corresponding in shape to said end plates to thereby firmly hold and support said telescoping members and limit them from longitudinal movement or downward vertical movement, and

each of said outer walls comprising a pair of nonconnecting lips projecting towards one another from each of said end walls, each of said lips having opening means for mounting said bracket to the side frame of said doorway and limiting relative movement between said lips, said inner wall of each of said mounting brackets comprising a pair of lips projecting towards one another from each of said

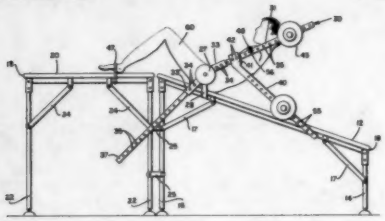
end walls and having upper and lower portions, said lips being intergrally connected only at said lower portion to form a notch in said upper portion adapted to receive the adjacent portion of said telescoping tube member, and said connection at said lower portion of said inner walls preventing outward deflection of said lips when downward force is exerted on said telescoping members mounted in said brackets.

4,405,128

MUSCULAR EXERCISE APPARATUS AND METHOD

Thomas M. Mclaughlin, Dadeville, Ala.; William D. McLeod, Columbus, Ga.; Neis H. Madsen, Auburn, Ala., and Ronald G. Peyton, Marietta, Ga., assignors to Totem, Inc., Atlanta, Ga.

Filed Dec. 11, 1980, Ser. No. 215,227
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **4 Claims**



1. A sit-up exercise apparatus comprising:

a table;

a first elongated weight arm pivotally mounted at one end thereof about a pivot axis adjacent to the upper surface of said table said arm supporting a weight being spaced there-along from said pivot axis;

chest-engaging means attached to said first weight arm spaced apart from said pivot axis for engaging the chest of a person so as to raise and lower the first arm while performing a sit-up exercise while being positioned on the table;

a second elongated weight arm having a weight attached thereto and extending at an angle from said first weight arm so as to extend behind the axis extending from the shoulder to the hip of a user, said table being elevated to permit free movement of said second weight arm with said first weight arm; and

means for adjustably retaining said second weight arm at any one of a plurality of positions along said first weight arm.

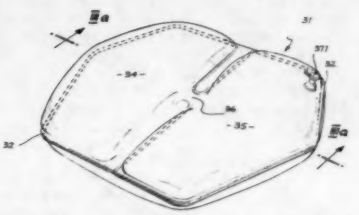
4,405,129

THERAPEUTIC EXERCISE DEVICE

Joan Stuckey, 166 Burns Rd., Turramurra, Sydney, New South Wales, Australia 2074

Filed Apr. 13, 1981, Ser. No. 253,394
Claims priority, application Australia, Apr. 17, 1980, PE 3165; Nov. 18, 1980, PE 6527; Feb. 4, 1981, PE 7472
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—130 **9 Claims**

1. A theraputic exercise device comprising two closed containers formed from flexible, substantially inextensible sheet material and having substantially the same shape, said containers being located one above the other with no fluid communication between said two containers; the upper one of said two containers being shaped to permit compression of same by at least two portions of a human body, being filled with fluid to partially pressurise the interior of said upper container with the pressure therein being less than that required to make said upper container rigid; said upper container being formed into at least two compartments by partions; and each of said compartments being in direct fluid communication with at least one other of said compartments via at least one passage to restrict the flow of fluid between said compartments in response to an external force applied to at least one of said compartments by movement of one of said human body portions to reduce the



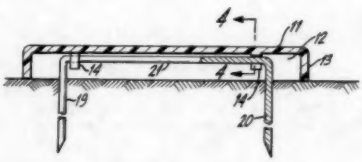
volume of said one compartment, whereby the remainder of said compartments expand in volume thereby exerting a movement inducing force on the other ones of said human body portions.

4,405,130

LOCATION INDICATOR FOR USE IN BASEBALL AND SIMILAR GAMES

David A. Mullany, 275 Bridgeport Ave., Shelton, Conn. 06484

Filed Apr. 23, 1981, Ser. No. 256,706
Int. Cl.³ A63B *71/02*
U.S. Cl. 273—25 **9 Claims**



1. A ground anchored base for baseball or the like comprising:

a plate extending in a plane and having a top surface and an underside,

a ground anchor having prongs arranged for anchoring insertion into the ground and which are integrally interconnected by an intermediate rod providing an engagement between said ground anchor and said plate, and

means fixedly connected to the plate for snap lockingly resiliently connecting the intermediate rod of the ground anchor to the plate in spaced relation to the underside of the plate for fixing the plate against relative movement within its said plane when the prongs are inserted into the ground.

4,405,131

PUZZLE CUBE

Tibor Horvath, 1877 E. 27th St., Brooklyn, N.Y. 11229

Filed Sep. 25, 1981, Ser. No. 305,479
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **12 Claims**

1. A puzzle device comprising;

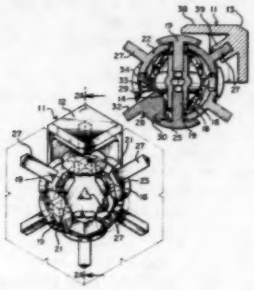
an inner core member;

a plurality of mutually spaced retainer members connected to and spaced from and surrounding said core member and having inside faces lying in a spherical plane concentric with said core member;

a plurality of peripherally spaced slide members underlying said retainer member inside faces and each being movable

in circular paths about orthgonally related axes intersecting at the center of said spherical plane;

a face member connected to each of said slide members and disposed outwardly of said slide and retainer members; including one interlocking member having a plurality of



rib elements in locking engagement with three of said retainer members and a plurality of tongue elements in releasable locking engagement with three of said slide members; and

a face member connected to said interlocking member.

4,405,132

TARGET MEMBER SIMULATING AN OBJECT TO BE FIRED ON

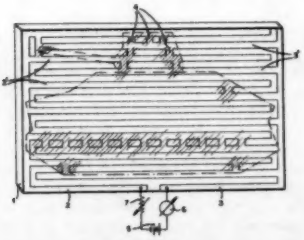
Claude Thalmann, Muri, Switzerland, assignor to Polytronic AG, Muri, Switzerland

Filed Sep. 3, 1981, Ser. No. 299,186

Claims priority, application Switzerland, Sep. 4, 1980, 6638/80

Int. Cl.³ F41J *1/00*

U.S. Cl. 273—348.1 **3 Claims**



1. A device usable in firearm practice, comprising an upright target member having a front surface provided with a multiplicity of radiation-emitting areas simulating the thermal signature of an object to be shot at,

said front surface being covered by two interleaved arrays of parallel conductor strips, said radiation-emitting areas being constituted by short patches of resistance material bridging adjacent conductor strips of said arrays,

the conductor strips of said arrays being connected across a power supply for energizing said patches in parallel to make them act as localized heat sources.

4,405,133

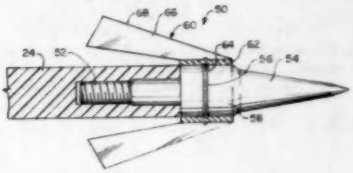
PRACTICE ARROW ADAPTER SIMULATING HUNTING ARROW CHARACTERISTICS

Clifford S. Cartwright, Jr., 1612 Scott Rd., Pylesville, Md. 21132

Filed Sep. 29, 1982, Ser. No. 428,136

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—419 **8 Claims**



1. A system for use with an arrow having a shaft with a forward portion, comprising a practice tip for shooting into a practice target, means for securing the practice tip to a said forward portion, means adapting said practice tip for simulating a hunting head, and means preventing said means adapting from embedding in said practice target with the practice tip.

4,405,134

NON-CONTACTING GAS SEAL FOR RELATIVELY ROTATING PARTS

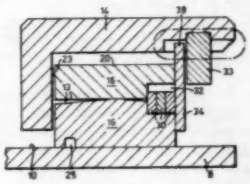
Raymond F. Sargent, and Paul Newman, both of Bristol, England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 20, 1982, Ser. No. 341,086

Claims priority, application United Kingdom, Jan. 31, 1981, 8103023

Int. Cl.³ F16J *15/16*

U.S. Cl. 277—3 **3 Claims**



1. A non-contacting seal for reducing fluid flow between relatively rotatable components of a machine comprises a seal ring having a sealing face, the seal ring being adapted to be disposed, in operation, on one of the components with its sealing face confronting a co-operating sealing face on the other component to form a seal therebetween, means for locating the seal ring in a housing with freedom of movement in a direction normal to said sealing faces, the seal ring being formed in a plurality of segments, each having a face which includes a sealing area and a lifting area said sealing area forming part of the sealing face of the ring, and further means for providing a seal between the ring and the housing, characterised in that:

the lifting area of each segment extends from the leading end to the trailing end thereof,

the leading end of each segment has a surface arranged to overlap a surface at the trailing end of an adjacent segment in such a manner as to provide a step between the ends of the adjacent segments whereby, in use, a tapering gap is produced between at least the lifting area of each segment face and the confronting sealing face of said other member, which converges towards the trailing end of each segment,

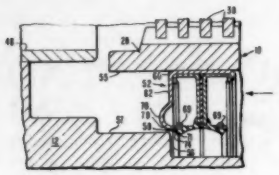
the means for forming a fluid seal between the seal ring and the housing comprises a narrow land on that side-face of each of the segments which lies on the lower pressure side of the seal ring, said land contacting a confronting sealing face on the housing and providing a fulcrum to allow tilting of each pad relative to the housing, and at least one of the overlapping surfaces of the segments is contoured to provide a second fulcrum to allow said tilting to take place.

4,405,135

WHEEL HUB AND SPINDLE SEAL

Donald L. Ries, Dearborn Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1982, Ser. No. 338,688
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—11 **6 Claims**



1. A fluid seal comprising:

an outer annular metal case formed to provide an axially extending web having a flange extending radially inward at one end thereof,

an inner annular metal member having a wall and a flange terminating in an edge of a given diameter,

means securing said outer case and said inner member together with said flange of said inner annular member extending radially inwardly relative to said metal case web, and

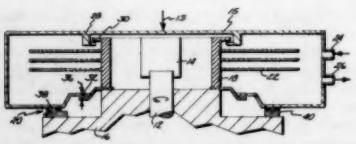
a resilient annular sealing element secured to said flange of said inner annular member and providing a sealing lip normally located at a first position radially inwardly of said edge of said inner member, said lip being displaceable radially outwardly to a second position located radially inwardly of said edge of said inner member, said radially inwardly extending flange of said outer case terminating in an edge located radially between said second position of said lip seal and said edge of said inner annular metal member and a portion of said radially inward extending flange of said outer metal case adjacent said edge is formed as an oblique surface sloping toward said sealing lip.

4,405,136

PNEUMATIC CARTRIDGE SEAL FOR COMPUTER DISC DRIVE CARTRIDGE

John W. Elsing, Minneapolis, and Steven D. Knopp, Bloomington, both of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 27, 1982, Ser. No. 453,401
Int. Cl.³ G11B *17/02*; F16J *15/46*
U.S. Cl. 277—12 **4 Claims**



1. A cartridge disk drive seal for preventing contaminated air from entering into the interior of a cartridge through the running clearance between the cartridge housing and hub when the cartridge is mounted on the disk drive's spindle, comprising:

an annular stop mounted on said disk drive's spindle housing and positioned for abutment against the bottom of said cartridge housing; said annular stop having mounted therein across its top three concentric channels opening toward said cartridge housing;

an annular flexible tube seal mounted in an inner one of said channels;

an intermediate one of said channels connected to connection means for connection to a source of pressurized air;

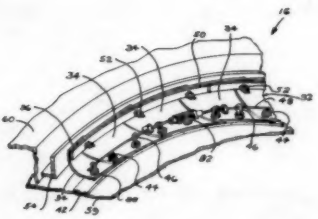
an annular flap seal means mounted in an outer one of said channels; the portion of said annular, stop separating said intermediate channel and said outer channel adapted to allow pressurized air from said intermediate channel enter said outer channel and force said flap seal into abutment with the bottom of said cartridge housing.

4,405,137

METAL LEAF ROTARY SEAL FOR ROTARY DRUM

Samuel B. Webb, 450 Highland Ave., Naperville, Ill. 60540

Filed Oct. 29, 1982, Ser. No. 437,563
Int. Cl.³ F16J *15/32*; F27B *7/24*
U.S. Cl. 277—153 **6 Claims**



1. A rotary seal for sealing a large, high temperature rotary drum to a stationary hood where said drum is mounted for rotation with respect to said hood about an axis of rotation defining axial planes, said drum having a substantially circularly cylindrical surface near one open end thereof substantially coaxial with said axis of rotation, and said hood being open to the interior of said drum through said open end, said seal comprising:

a series of overlapping leaves of resilient metal disposed successively to encircle said cylindrical surface, each said leaf having an inner surface and an outer surface and a mounting end and a sealing end, with said mounting end affixed to said stationary hood, and said sealing end disposed at said cylindrical surface with said outer surface concave in a said axial plane, each said leaf extending from said mounting end to said sealing end obliquely relative to a said axial plane therethrough so that said sealing end is displaced circumferentially a substantial distance relative to said mounting end, and each said leaf further having a sealing edge on said outer surface between said mounting and sealing ends extending obliquely of a said axial plane, said sealing edge being disposed beneath the inner surface of an adjacent leaf,

a wear liner disposed on the inner surfaces of said leaves at their sealing ends for spacing said sealing ends from said cylindrical surface and having an inner surface on a side opposite said sealing ends for mating with said cylindrical surface, and

means for securing said sealing ends to said wear liner and forcing said inner surface of a respective leaf against said sealing edge of the respective adjacent leaf while leaving

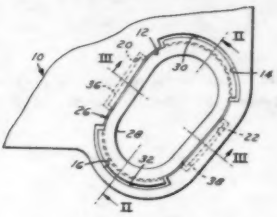
said respective sealing edge free to move relative to said respective inner surface upon flexure of said seal when said drum moves radially relative to said hood.

4,405,138

ENGINE GASKET ASSEMBLY

Robert R. Skrycki, Grosse Ile, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 27, 1982, Ser. No. 423,588
Int. Cl.³ F16J 15/12
U.S. Cl. 277—235 B **5 Claims**



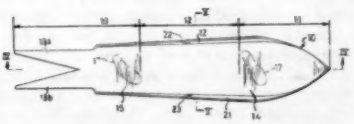
1. An engine gasket assembly adapted to being positioned between engine components, said gasket assembly comprising a gasket body having first and second planar surfaces and at least one opening for a fluid passage formed therethrough, a first pair of oppositely disposed recesses formed adjacent the opening in the first planar surface, a second pair of oppositely disposed recesses formed adjacent the opening in the second planar surface with the centerline therebetween at right angles to the centerline between said first pair of recesses, a molded rubber grommet having a tubular body portion mounted inside the opening, a first pair of oppositely disposed locking tabs formed on the outer surface of said grommet adjacent one face thereof and seated in said first pair of oppositely disposed recesses, and a second pair of locking tabs formed on the outer surface of said grommet adjacent the other face thereof and seated in said second pair of oppositely disposed recesses.

4,405,139

BOARDS FOR SLIDING ON SNOW

Kuniaki Kawahard, 5-8, Sakuragaokar, 4-Chome, Setagaya-ku, Tokyo, Japan

PCT No. PCT/JP79/00002, § 371 Date Sep. 5, 1980, § 102(e) Date Aug. 26, 1980, PCT Pub. No. WO80/01371, PCT Pub. Date Jul. 10, 1980
PCT Filed Jan. 5, 1979, Ser. No. 253,769
Int. Cl.³ B62B 17/00
U.S. Cl. 280—12 H **6 Claims**



1. Board for sliding on snow, comprising a board body which includes nose, intermediate and tail portions, each of said nose and tail portions having such a thickness that it will not be deformed by the weight of a user placed thereon, said intermediate portion having such a thickness that it will be elastically bent by the user's weight, said board body being shaped into an inverted arch bend; a side plate mounted on each of the side edges of said board body to extend longitudinally thereof; and step-decks for the user's stance which are located on the respective connections between said nose and intermediate portions and between said intermediate and tail portions, said step-decks being inclined downwardly toward said intermediate portion; said tail portion having at least one pin tail configuration: characterized in that said pin tail includes a fin-box embedded therein at the bottom of said pin tail, said fin-box including a fin which is detachably mounted therewithin such that the fin will be released when a force is applied thereto that is stronger than a predetermined level.

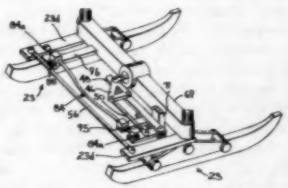
6. Board for sliding on snow, comprising a board body which includes nose, intermediate and tail portions, each of said nose and tail portions having such a thickness that it will not be deformed by the weight of a user placed thereon, said intermediate portion having such a thickness that it will be elastically bent by the user's weight, said board body being shaped into an inverted arch bend; a side plate mounted on each of the side edges of said board body to extend longitudinally along said nose portion, said intermediate portion and a part of said tail portion, each of said side plates being inclined upwardly from the corresponding side edge of the top surface of said board body; step-decks for the user's stance which are located on the respective connections between said nose and intermediate portions and between said intermediate and tail portions, said step-decks being inclined downwardly toward said intermediate portion; and said tail portion being shaped into a double-pin tail configuration which includes pin-tails of a tapered trigonal pyramid configuration.

4,405,140

BOBSLED

David B. Stevens, Oconomowoc Lake Village, Wis., assignor to Excalibur Automobile Corporation, West Allis, Wis.

Continuation-in-part of Ser. No. 179,012, Aug. 18, 1980, Pat. No. 4,348,033. This application Mar. 17, 1982, Ser. No. 359,123
Claims priority, application United Kingdom, Aug. 29, 1979, 7929979
Int. Cl.³ B62B 13/08
U.S. Cl. 280—16 **4 Claims**



1. A bobsled which comprises:

a frame;

front and rear axles coupled to the frame through a suspension;

two front runner assemblies linked together and each pivotably connected to a respective end of the front axle;

two rear runner assemblies linked together and each pivotably connected to a respective end of the rear axle;

a front steering motion translator and a rear steering motion translator coupled together by a steering linkage and carried by the frame; and

front and rear steering control linkages each having a flexible middle portion carried in a flexible sheath and having rigid end portions extending out the opposite ends of the sheath, a first rigid end portion being connected to one of the runner assemblies at its corresponding end of the bobsled and the end of the sheath around the first rigid portion being coupled to the axle at the same end of the bobsled, the other rigid end portion of the sheathed member being coupled to the steering motion translator at the same end of the bobsled and the other end of the sheath being pivotably coupled to the frame, to allow the operation of each sheathed member in actuating the movement of its corresponding pair of runner assemblies to be inde-

pendent of the displacement of the axle relative to the frame.

4,405,141

SERVICING STEPS TO BE MOUNTED ON THE BUMPER OF A TRUCK

Leonard B. Jurek, 4206 - 2nd St., NE., Columbia Heights, Minn. 55421

Filed May 26, 1981, Ser. No. 266,840
Int. Cl.³ B60R 3/00
U.S. Cl. 280—163 9 Claims

8. A quick mounting servicing step to be supported on the bumper of a truck that requires servicing comprising a step body including a fulcrum plate section adapted to rest during use against the upper surface of the bumper and having a bumper engaging hook on its free edge, a platform section rigidly associated with the fulcrum section, said platform section comprising a support surface positioned horizontally and when mounted on the bumper extending outwardly from the bumper away from the truck whereby the weight of a user applied to the platform section causes the step body to act as a lever arm having a fulcrum point such that the hook is forced upwardly and is thereby jammed into binding engagement with the bumper whereby the step will stay securely in place during use but can be quickly mounted and later demounted by raising the platform section and sliding the step toward the truck to disengage the hook from the bumper, said platform section and fulcrum plate section lie in intersecting planes whereby the step has a predetermined contour, a member is connected to the lower surface of the step to provide a sheath between the step and the member to receive a brace number, said brace member has a bumper engaging foot at one end adapted to contact the bumper and help support the step after the user mounts the step; said brace being bent upwardly at one end to define said foot and the foot end of the brace conforms to said contour of the step when the brace is in a storage position within the sheath and said brace is removeable so that it can be inverted and reinserted into the sheath to assume an operating position.

4,405,142

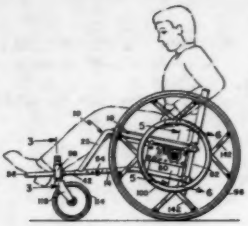
KNOCK DOWN WHEEL CHAIR

Donald L. Whetstine, San Diego, Calif., assignor to Stainless Medical Products, Inc., San Diego, Calif.

Filed Mar. 9, 1981, Ser. No. 241,750
Int. Cl.³ A61G 5/02
U.S. Cl. 280—242 WC 24 Claims

1. A quick breakdown wheel chair assembly comprising a pair of side frames,

a front frame telescopically engaging said side frames for adjusting the length of the chair assembly including quick release pins for detachably connecting said side frames together at the front thereof and a back frame including quick release pin means for detachably connecting said side frames together at the back end thereof, wherein said front frame has a generally A configuration with a forward foot bar and an intermediate leg support bar, and a pair of castors mounted at the ends of said leg support bar.

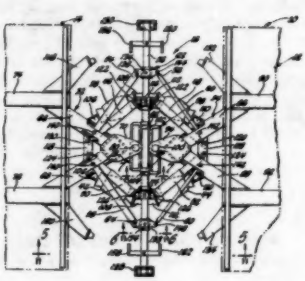


4,405,143

HINGE CONNECTION FOR ARTICULATED VEHICLES

Johannes W. Rosenkrands, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1981, Ser. No. 303,393
Int. Cl.³ B62D 53/00; B60D 1/00
U.S. Cl. 280—403 7 Claims



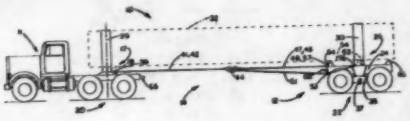
1. A hinge connection for interconnecting the front section with the rear section of an articulated vehicle, said hinge connection comprising a shaft member having a longitudinal center axis adapted to be located in a horizontal plane between said front section and said rear section and to extend transversely relative to said articulated vehicle; a first hinge member adapted to be secured to said front section; a second hinge member adapted to be secured to said rear section; means connecting said first hinge member and said second hinge member to said shaft member so as to allow said front section to be angularly displaced relative to said rear section about a pair of longitudinally spaced vertical axes and about said longitudinal center axis of said shaft member so as to permit said articulated vehicle to negotiate turns and to travel over crests and valleys in a road surface; and means operatively connected between each of said first and second hinge members and said shaft member for maintaining said pair of spaced vertical axes aligned and located along the longitudinal center axis of said articulated vehicle during straight-ahead travel thereof and for positioning said shaft member so that said longitudinal center axis of said shaft member bisects the turn angle between said front section and said rear section when said articulated vehicle is in a turn.

4,405,144

SELF ALIGNING TRUCK TRAILER

Arthur D. Chambers, P.O. Box 702, Lumby, British Columbia, Canada (V0E 2G0)

Continuation of Ser. No. 182,839, Aug. 29, 1980, Pat. No. 4,358,128. This application Apr. 19, 1982, Ser. No. 369,917
Int. Cl.³ B60P 3/40
U.S. Cl. 280—404 8 Claims



1. Apparatus for use in a tractor and trailer combination for carrying an elongated, self-supporting load in which the tractor has a swivable front bunk mounted for pivoting about a pivot axis and is adapted to retain a front portion of the load thereon, and the trailer has a rear bogey having at least one pair of road bearing wheels and a non-swivelling rear bunk mounted on the bogey and adapted to retain a rear portion of the load thereon the apparatus comprising:

means for aligning the trailer with the front bunk, said aligning means including flexible link means having right and left hand forward link portions extending rearwardly from the front bunk, and right and left hand rear link portions extending forwardly from the trailer,

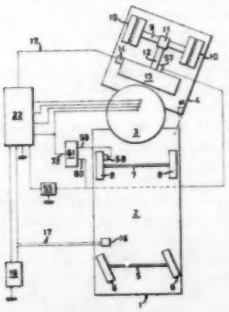
the forward and rear link portions defining two isosceles triangles having vertices connected to one another along the central longitudinal axis of the combination.

4,405,145

ARRANGEMENT FOR LIMITING UNCONTROLLED ARTICULATION MOVEMENTS AT THE PICOT BETWEEN VEHICLE UNITS IN ARTICULATED VEHICLES, PREFERABLY ARTICULATED BUSES

Hans I. Bergman, and Björn D. Nyman, both of Katrineholm, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 30, 1981, Ser. No. 279,013
Claims priority, application Sweden, Jul. 3, 1980, 8004928
Int. Cl.³ B62D 53/00; B60K 26/00
U.S. Cl. 280—432 9 Claims



1. An arrangement in articulated vehicles, preferably articulated buses, for limiting uncontrolled articulation movements between a leading vehicle unit and a trailing vehicle unit articulatedly connected thereto and equipped with driving wheels which are driven by means of a driving unit under the control of at least one activated power control means, characterized in

that movement-sensing sensors sense parameters representing operating conditions for the leading and trailing vehicle units,

that at least one of the sensors gives an output signal to a comparison means, in which the output signal is compared with a reference signal, and

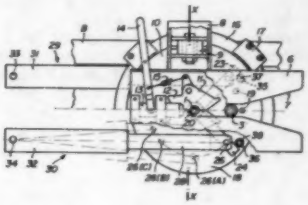
that the comparison means gives an output signal in response to a comparison between the output signal from the sensor and the reference signal to the power control means which limits the power transmittable to the driving wheels.

4,405,146

COUPLING FOR AN ARTICULATED VEHICLE OR THE LIKE

David C. Mitchell, 20 chemin des Rasses, 1255 Veyrier, Geneva, Switzerland

Filed Jul. 30, 1981, Ser. No. 288,415
Claims priority, application United Kingdom, Oct. 29, 1980, 8034746
Int. Cl.³ B62D 53/06
U.S. Cl. 280—432 10 Claims



1. An apparatus for controlling rotational movements about a substantially vertical axis of a coupling between a tractor part and a trailer part of an articulated vehicle, comprising:

a pair of fluid operated rams positionally fixable relative to one of said tractor and trailer parts;

a first pair of abutments positionally fixable relative to the other of said tractor and trailer parts on opposite sides of said axis; and

a pivotal arm at one end of each of the rams, extending generally radially of and towards a shaft coaxial with said axis and pivotably mounted thereon, said arms forming a second pair of abutments on opposite sides of said axis which cooperate in freely disengagable manner with said first pair of abutments, whereby only one ram at a time is operable to resist rotation between the tractor and trailer parts away from a neutral position corresponding to an aligned position of the tractor and trailer parts and operable to return the tractor and trailer parts back to said neutral position, the other ram remaining during that time in a fully extended position.

4,405,147

TRAILER STEERING DEVICE FOR SPACED AXLE TRAILER

John Horsman, Scottsdale, and James W. Ryden, Phoenix, both of Ariz., assignors to U-Haul Technical Center, Phoenix, Ariz.

Filed Jun. 19, 1981, Ser. No. 275,504
Int. Cl.³ B60D 1/00
U.S. Cl. 280—443 14 Claims

1. A trailer comprising in combination:

(a) a frame having a front portion and a rear portion;

(b) tongue means pivotally connected to said front portion for effecting connecting of said trailer to a trailer hitching means attached to a tow vehicle;

(c) first and second rear wheels and rear axle means for supporting said rear portion of said frame, said first and

second rear wheels being rotatably connected to said rear axle means;

(d) first and second front wheels and front axle means for supporting said front portion of said frame, said first and second front wheels being rotatably connected to said first axle means;

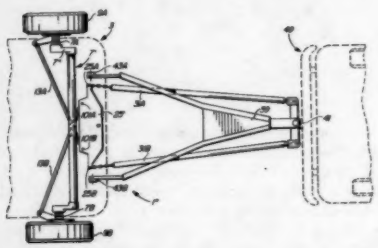
(e) pivot connecting means for pivotably connecting said tongue means to said front portion and confining pivotal movement of said tongue means to a substantially vertical direction relative to a support surface supporting said trailer, said tow vehicle including a trailer guiding means rigidly connected to said tow vehicle and having first and second trailer connecting points spaced from and located on opposite sides of said trailer hitching means;

(f) first and second spindle means for pivotally connecting said first and second wheels, respectively, to said front axle means to effect steering of said trailer;

(g) first and second lever arms connected to said first and second spindle means, respectively, to effect controlled pivoting of said first and second spindle means;

(h) primary steering arm means having first, second and third spaced points thereon pivotally connected at said first point to said frame for effecting pivoting of said spindle means in response to changing of direction of said tow vehicle relative to said trailer;

(i) first coupling means for coupling said first and second lever arms to said primary steering arm means to effect pivoting of said first and second spindle means in response to pivoting of said primary steering arm means;



(j) first tensile connecting means for connecting said second point of said primary steering arm means to said first trailer connecting point to pull said second point of said primary steering arm members toward said tow vehicle to cause pivoting of said primary steering arm means in response to turning of said tow vehicle in a first direction relative to said trailer;

(k) second tensile connecting means for connecting said third point of said primary steering arm means to said second trailer connecting point to pull said third point toward said tow vehicle in response to turning of said tow vehicle in a second direction relative to said trailer, said first and second tensile connecting means exerting only substantial pulling forces on said primary steering arm means to cause pivoting of said primary steering arm means;

(l) a plurality of wheel brake mechanisms for controllably applying braking forces to at least one of said front and rear wheels, said tongue means including mechanical surge braking means for connection to said trailer hitching means to actuate said wheel brake mechanisms in response to a rearward force exerted by said trailer hitching means on said tongue means, said first and second tensile connecting means allowing shortening of the effective length of said tongue means due to actuation of said mechanical surge braking means without exerting rearward forces on said second and third points of said primary steering arm means;

wherein said first tensile connecting means includes a first rigid member having first and second ends and first flexible means connected to the first end of said first rigid member and to said primary steering arm means for preventing said first tensile connecting means from producing a substantial pushing force on said primary steering arm means, and wherein said second tensile connecting means includes a second rigid member and second flexible means connected to a first end of said second rigid member for preventing said second tensile connecting means from producing a substantial pushing force on said primary steering arm means.

4,405,148

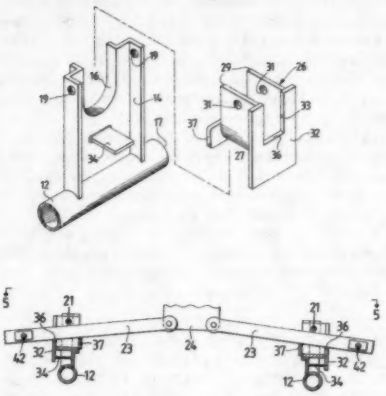
INSERT FOR VEHICLE TOW BAR

Eugene D. Dickerson, Rte. 1, Box 237, Sterrett, Ala. 35147

Filed Jul. 20, 1981, Ser. No. 284,547

Int. Cl.³ B60D 1/16

U.S. Cl. 280—491 E **7 Claims**



1. In a tow bar insert for use with a tow bar having connector means at the forward end thereof adapted for connection to a towing vehicle and a bifurcated member having rearwardly extending arms carrying upstanding brackets at the rear ends thereof, with an upwardly opening recess in each said bracket in position to receive an adjacent portion of a laterally and outwardly extending control arm pivotally connected at its inner end to the frame of a towed vehicle and pivotally connected at its outer end to the spindle assembly of an adjacent front wheel of said towed vehicle,

(a) a generally U-shaped member adapted to fit within and engage each said upwardly opening recess in said upstanding brackets with each said U-shaped member having a base portion connected to spaced apart legs,

(b) a transverse load bearing member carried by each said U-shaped member in position to engage and support an adjacent control arm of said towed vehicle while it extends through said U-shaped member,

(c) detachable means connecting each said U-shaped member to is upstanding bracket and adapted to limit movement of said U-shaped member relative to its control arm,

(d) a connector arm pivotally connected at one end to said U-shaped member with the other end thereof extending toward an adjacent portion of a sway bar connecting said control arms, with said connector arm being movable selectively to a connected position in engagement with said sway bar and to a disconnected position out of engagement with said sway bar,

(e) resilient means between said connector arm and said U-shaped member urging said connector arm toward said connected position, and

(f) at least one stop member carried by said U-shaped member limiting vertical movement of said connector arm.

4,405,149

SKI WITH VIBRATION-DAMPING MEANS

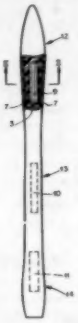
Yves Piegay, Voiron, France, assignor to Skis Rossignol S.A., Voiron, France

Filed Apr. 24, 1981, Ser. No. 257,114

Claims priority, application France, Feb. 21, 1980, 80 04128; Apr. 9, 1981, 81 07520; European Pat. Off., Apr. 13, 1981, 81420053.1; Canada, Apr. 23, 1981, 376036; Japan, Apr. 23, 1981, 56-60720

Int. Cl.³ A63C 5/04

U.S. Cl. 280—602 8 Claims



1. A ski comprising an elongated ski body having a spoon at the forward end thereof, a binding region centrally thereof and a heel at the rear end of the body, said body being formed with a core, and at least two generally flat bands of visco-elastic material constrained within said core and spaced apart longitudinally along said body, said bands extending longitudinally within said body and each having a length between 10 and 20% of the total length of the ski.

4,405,150

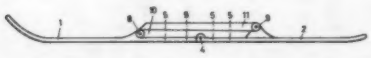
COLLAPSIBLE SKIS

Herbert Esper, Burgermeister-Heinrich-Strasse 23, 8403 Bad Abbach, Fed. Rep. of Germany

Claims priority, application European Pat. Off., Jun. 19, 1980, 80103411.7; Jun. 23, 1980, 80103037.0

Int. Cl.³ A63C 5/02

U.S. Cl. 280—603 10 Claims



1. A collapsible ski having a front ski part having a ski toe and a back ski part, a join for joining said front ski part and said back ski part together for forming a ski base-part, a ski top part, said ski top part being formed by two elements one of which is pivotally joined to the ski front part and the other of which is pivotally joined to the ski back part, said ski top part being placeable at least in part in a recess in the ski base-part and lockable in position on said ski base-part by fixing means.

4,405,151

LOCKING DEVICE FOR AN ELECTRONIC SAFETY SKI BINDING

Walter Knabel, Farchant; Gerd Klubitschko, Oberau; Lorenz Stempfhuber, Garmisch-Partenkirchen, all of Fed. Rep. of Germany, and Nicholas F. D'Antonio, Liverpool, N.Y., assignors to Marker Patentverwertungsgesellschaft mbH, Baar, Switzerland

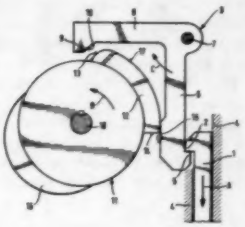
PCT No. PCT/EP80/00058, § 371 Date Mar. 2, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00216, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 16, 1980, Ser. No. 243,920

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1979, 2928681

Int. Cl.³ A63C 9/08

U.S. Cl. 280—612 6 Claims



6. In an electronic safety ski binding having a movable sole retainer, wherein an electrical signal is generated to effect movement of the sole retainer, a locking device comprising:

a locked member connected to the sole retainer, said locked member being movable between a releasing position for enabling movement of the sole retainer and a retaining position for preventing movement of the sole retainer;

a locking member movable between a first position for holding said locked member in the retaining position and a second position for enabling movement of said locked member to the releasing position; and

a rotatable member having abutment means for abutting said locking member to move said locking member from said first position to said second position in response to the generation of said electrical signal.

4,405,152

SKI BINDING JAW

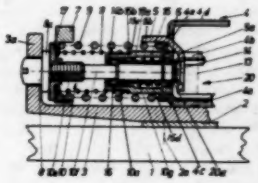
Theodor Nitschko, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jul. 22, 1981, Ser. No. 285,702

Claims priority, application Austria, Aug. 26, 1980, 4300/80

Int. Cl.³ A63C 9/22

U.S. Cl. 280—625 12 Claims



1. In a front jaw for a safety ski binding, having a pair of two-arm sole holders which are arranged symmetrically with respect to the longitudinal center plane of said jaw and are pivotally arranged on a pivot means arranged vertically with respect to the upper side of a ski, each said sole holder having

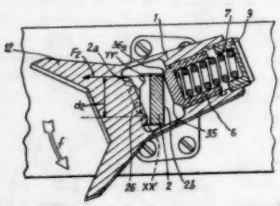
a first arm adapted to engage a ski shoe sole and a second arm engaging a slide member which is movable against the force of a release spring, said release spring having one end thereof supported on a fixed abutment means and its other end supported on an adjustably movable abutment means, said adjustably movable abutment means including an adjusting screw which extends in the longitudinal direction of said ski, said release spring becoming relaxed after a swinging out of one of said two sole holders which exceeds a predetermined limit, and wherein for returning said slide member at least one return spring is provided, the improvement comprising wherein said adjusting screw comprises three sections which are axially offset from one another, the center section having a smaller diameter than the two outer sections and the outer section adjacent said fixed abutment means having a locking edge thereon which radially offsets it from said center section, said adjusting screw being rotatably and axially movably supported in a sleeve which is secured to said slide member, an outer cylinder at least in an axial direction, partially surrounding said sleeve, said sleeve having plural balls thereon which rest both on an interior wall of said outer cylinder and said adjusting screw, means defining a release edge on said interior wall of said outer cylinder initially located between said fixed abutment means and said locking edge when said jaw is in a ski boot holding position, and wherein said balls in said ski boot holding position of said jaw engage said locking edge of said adjusting screw.

4,405,153

SAFETY BINDING FOR SKI

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 19, 1981, Ser. No. 245,460
Claims priority, application France, Mar. 21, 1980, 80 06365
Int. Cl.³ A63C 9/085
U.S. Cl. 280—629 **38 Claims**



1. A safety binding for a ski, comprising:

(a) a support means adapted to be fixed to said ski, having a rear transverse face with at least two recesses therein and a front transverse face;

(b) a body comprising:

(i) a holding means adapted to hold a ski boot;

(ii) a transverse face on said body, having at least two projections thereon, each projection adapted to engage one of said recesses, wherein said recesses and projections define two lines of support converging at a point above said ski and disposed respectively, on either side of the longitudinal plane of symmetry of said ski, so that said body may pivot around either one of said lines of support; and

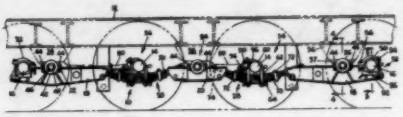
(iii) an abutting means for causing said transverse face of said body to abut said rear face of said support, wherein said abutting means includes a rear face which abuts said front transverse face of said support and which includes two lines of reaction converging toward said ski.

4,405,154

MULTI-AXLE EQUILIZED SUSPENSION SYSTEM

Lloyd D. Masser, Twin Lakes, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed May 15, 1981, Ser. No. 263,981
Int. Cl.³ B60G 5/00
U.S. Cl. 280—686 **6 Claims**



1. A suspension for a multi-wheeled vehicle comprising:

a pair of outer equalizing beams each of which is mounted to a trunnion tube and rockable thereabout;

means for securing said trunnion tubes to a load supporting member of said vehicle so as to mount said pair of outer equalizing beams to said vehicle;

a pair of axles mounted to said pair of outer equalizing beams at the outer ends thereof, said axles supporting ground engaging wheels;

at least one inner equalizing beam rockably mounted to a trunnion tube;

means for securing said trunnion tube to said vehicle frame between said pair of outer equalizing beams;

at least two leaf spring assemblies suspended between said pair of outer equalizing beams, each of said at least two leaf spring assemblies being secured between one of said pair of outer equalizing beams and an inner equalizing beam;

each of said leaf spring assemblies mounting an axle supporting ground engaging wheels; and

means for limiting relative axial displacement of at least one of said axles supported on said leaf spring assemblies relative to said outer axles;

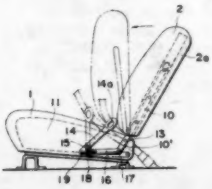
wherein said pair of outer equalizing beams and said at least one inner equalizing beam distribute the load of said vehicle equally over the axles.

4,405,155

SEAT BELT DEVICE FOR AN AUTOMOTIVE VEHICLE

Hideoki Matsuoka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1981, Ser. No. 273,049
Claims priority, application Japan, Jul. 25, 1980, 55-105972[U]
Int. Cl.³ A62B 35/00
U.S. Cl. 280—802 **1 Claim**



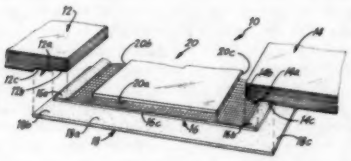
1. A seat belt device for an automotive vehicle disposed at the side surface of a seat including a seat cushion and a seat back, which comprises:

(a) a seat belt for protecting a driver or a passenger from injury caused by a shock, one end of said seat belt fixed to the upper rear side of a front door of the vehicle;

(b) a retractor disposed at a rearmost portion of the middle-side surface of the seat cushion for biasing said seat belt thereinto;

(c) a movable rod pivotably supported on a rearward portion of the middle-side surface of said seat cushion, said rod connected to said seat back for rotatable movement therewith;
(d) a belt guide member pivotably supported on said middle-side surface of said seat cushion at a point located forward of the point at which said movable rod is pivotably supported, one end of said belt guide member provided with a belt guideway having an aperture through which said seat belt is passed;
(e) a pin fixed on the other end of said belt guide member;
(f) a link lever, one end of which is pivotably connected to the other end of said movable rod and the other end of which is formed with a slot to which said pin is loosely fitted; and
(g) a belt guide stopper disposed in position on the middle-side surface of the seat cushion for restricting the backward movement of said belt guide member,
whereby said seat belt is moved back and forth when the seat back is tilted backward and forward and additionally the seat cushion can be moved further backward with said seat belt located at the rearmost position.

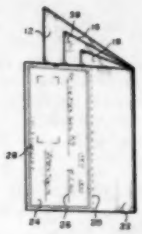
4,405,156
REINFORCED HINGE FOR BOOK COVER
Leewood C. Carter, Warren, and Robin P. Neary, Basking Ridge, both of N.J., assignors to Book Covers, Inc., Newark, N.J.
Filed Mar. 30, 1981, Ser. No. 249,089
Int. Cl.³ B42C *7/00*
U.S. Cl. 281—29 **13 Claims**



4. A book cover having a reinforced hinge, comprising:
first and second leafboards having respective first and second edge portions in opposed, spaced and parallel relationship;
a reinforcing member including first and second edges overlapping and being secured to said first and second edge portions, respectively;
a hinge member overlapping and adhered to the outer surface of said reinforcing member and extending beyond said first and second edges of said reinforcing member to overlap and directly adhere to said first and second edge portions of said leafboards, respectively;
a lining material overlapping and adhered to the inner surface of said reinforcing member, the longitudinal edges of said lining material being spaced from said first and second edge portions of said leafboards, respectively; and
said reinforcing member, said hinge member, and said lining material, all being adhered together and cooperating to form a reinforced hinge for said book cover.

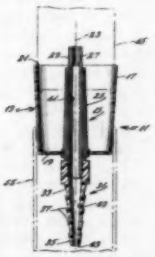
4,405,157
SURVEY DATA COLLECTING SYSTEM
Robert C. Bennett, 727 Decatur Dr., Mount Laurel, N.J. 08054
Filed Mar. 3, 1982, Ser. No. 354,452
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—58 **4 Claims**

1. A survey data collecting system comprising:
a booklet having a front leaf, a back leaf and at least one intermediate leaf, the height and width of said front and back leaves being substantially identical, the height of said intermediate leaf being substantially the same as said front and back leaves but the width thereof being somewhat less;
said back leaf being perforated throughout the height thereof intermediate its width so as to form a first portion adjacent the front leaf and a second portion remote therefrom;
the rear side of said second portion having indicia printed thereon to form a check, at least part of said indicia being



along an edge thereof and being comprised of magnetic ink;
the front side of said second portion having at least first and second columns of spaces thereon for indicating answers to questions printed on the front side of said first portion and on the front surface of said intermediate leaf;
the width of said intermediate leaf being sufficient to cover said first column of spaces but not said second column.

4,405,158
AIR FILLER ADAPTER
Richard Huberman, 7740 Bridlepath La., McLean, Va. 22101
Filed May 26, 1981, Ser. No. 266,643
Int. Cl.³ A47L *9/24*
U.S. Cl. 285—7 **1 Claim**



1. A nozzle adapter for providing medium and low inflation pressure from a variety of air sources to air fittings of diverse sizes comprising:
(a) an outer frustro-conical shell having a central axis, inner and outer surfaces and an outer circular lip, the outer circular lip being at the location of the largest diameter of the outer shell, the outer shell having an inside diameter which tapers gradually inwardly so that the inner and outer surfaces of the shell gradually decrease in diameter toward a bottom surface;
(b) said bottom surface having an opening in the center thereof;
(c) an annular stem means including a first stem and a second stem within said first stem, said first stem being sealingly mounted in said bottom surface opening and including an end remote from said bottom surface located within said shell, said second stem including a first end extending through said bottom surface opening and outside said

shell, said second end including exterior threads and further including interior threads forming an inlet to said second stem, said second stem first end including on an exterior surface thereof coupling means;

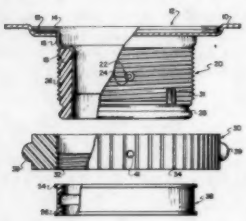
(d) a coupling member sealingly coupled to said coupling means of said second stem and abutting said first stem, said coupling member including a tapered passageway extending from a large diameter portion adjacent said coupling means to a small diameter portion adjacent an outlet of said coupling member, said coupling member further including a plurality of ridges extending from said location adjacent said large diameter portion to a location adjacent said coupling member outlet, said ridges enabling coupling of said coupling member to an inflatable object, said coupling member generally tapering from a large diameter adjacent to said coupling means to a small diameter adjacent to said outlet thereof.

4,405,159

WASTE DISPOSER COUPLING

Leonard G. Spelber, San Diego, Calif., assignor to Wastemate Corporation, San Diego, Calif.

Filed Jun. 16, 1981, Ser. No. 274,069
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—38 **3 Claims**



1. A coupling device for attaching a waste disposer unit having a circumferential groove near the top thereof to a sink having a drain opening therein, comprising:

substantially cylindrical drain conduit means for inserting through the drain opening in the sink, said drain conduit means including a body, and a flange extending from said body for positioning adjacent the upper surface of said sink bottom around said opening;

a reduced portion on said conduit body forming a coolar seat;

substantially cylindrical collar means for positioning on said collar seat, and having external threads thereon, said threads being substantially co-extensive with the circumference of the conduit body in the assembled position;

a circumferential groove near the bottom of said collar means;

fastening means for fastening said collar means to said collar seat;

connector ring means having internal threads extending from one end part way in the axial direction for engaging the threads on said collar means to lock said drain conduit means to the sink bottom by pulling said flange toward said sink bottom, said connector ring means being capable of connection to said collar means with either end facing the sink bottom to accommodate sink bottoms of different thicknesses;

resilient sealing means having an upper boss extending inwardly therefrom for seating in the groove in said collar means and a lower boss extending inwardly therefrom for seating in the groove in the disposer; and

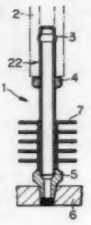
securing means surrounding said sealing ring means for securing said sealing ring means in position and pressing said bosses into sealing engagement with the side walls of said grooves.

4,405,160

HOSE JOINT WITH COOLING FINS

Tutomu Tyuuman, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 13, 1980, Ser. No. 206,662
Claims priority, application Japan, Jul. 24, 1980, 55-101578
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—39 **12 Claims**



1. A one-piece hose joint for connecting a flexible hose to a high-temperature object, comprising:

a tubular member having first and second ends, and a cooling portion intermediate said ends, a protuberance at the first end, said first end being connected to said flexible hose with said protuberance positioned within said hose;

a threaded member, and means securing said threaded member to said second end against movement relative thereto, said threaded member including a wrench-engageable head and further including a threaded end connected to said high-temperature object; and

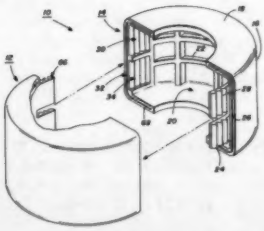
a plurality of fins fixedly engaging said cooling portion of said tubular member adjacent to said second end in axially spaced relationship with one another, the length of said cooling portion engaged by said fins being greater than that of said threaded member, and the radial width of said fins being greater than the width of said wrench-engageable head, said plurality of fins radiating heat conducted to said tubular member from said high-temperature object via said threaded member and intercepting radiant heat from said high-temperature object, whereby a temperature rise of said tubular member is restrained.

4,405,161

WELLHEAD SECURITY APPARATUS

A. Steven Young, and Gorby C. Mason, both of Garland, Tex., assignors to A. Steven Young, Garland, Tex., a part interest

Filed Jun. 9, 1981, Ser. No. 271,832
Int. Cl.³ F16L *55/00, 21/00, 25/00*
U.S. Cl. 285—80 **9 Claims**



1. A well head security apparatus comprising a housing having a first half and a second half, said first half and said second half being similar, each said half fabricated of an impact resistance plastic material, said housing having locking means

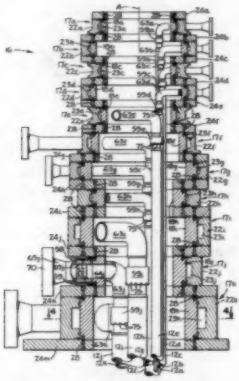
for securing said halves together and a metallic core for providing additional protection against the unauthorized removal of the security apparatus wherein disassembly of said housing requires the destruction of said locking means.

4,405,162

LARGE-DIAMETER MULTI-PASSAGE SWIVEL JOINT FOR HIGH PRESSURE SERVICE

Michael R. Williams, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 5, 1981, Ser. No. 240,725
Int. Cl.³ F16L 39/04
U.S. Cl. 285—95 15 Claims



1. A multi-passage swivel joint for simultaneous transfer of a plurality of separated fluids between a plurality of inlet conduits and a plurality of corresponding outlet conduits, said joint comprising:

a plurality of annular inner members each having a radially extending inlet port therethrough;

a plurality of annular outer members each having a radially extending outlet port therethrough, each of said outer members rotatably surrounding a corresponding one of said inner members;

a plurality of annular flat seal plates;

means for removably mounting each of said outer members between a pair of seal plates;

means for removably connecting each of said inner members between a pair of seal plates;

a plurality of annular fluid flow passages each defined by the outer surface of one of said inner members and the inner surface of a corresponding one of said outer members;

means for sealing each of the fluid flow passages at the junction of said outer members and said seal plates;

means for connecting each of said outlet conduits to a corresponding one of said outlet ports to rotatably connect each of said outlet conduits to a fluid flow passage;

means for connecting each of said inlet conduits to a corresponding one of said inlet ports to connect each of said inlet conduits to a fluid flow passage; and

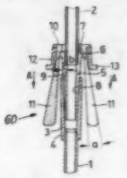
means for sealing each of the fluid flow passages at the junction of each of said inner members and said seal plates.

4,405,163

COUPLING FOR MEDICAL APPARATUS TUBES

Karl-Friedrich Voges; Claus Haacke, both of Melsungen, and Peter Heise, Fuldabrück, all of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Nov. 24, 1980, Ser. No. 209,744
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949865
Int. Cl.³ F16L 37/08
U.S. Cl. 285—305 10 Claims



1. A medical apparatus coupling, for connecting the ends of two tubes, comprising:

a first end piece for receiving a first tube end, with said first end piece having a conical outer surface and with the end piece being narrower at the end to which the first tube end is joined;

a second end piece having a first end, and a second end for receiving a second tube end;

a male conical member on the second end piece and a female conical bore on the first end piece;

a plurality of fingers, means connecting the fingers to a ring constituting a mounting on and around the second end piece, means securing the ring against axial movement toward the first end of the second end piece with said fingers extending axially along the outside of the first end piece; and

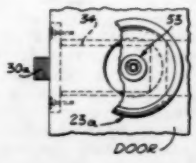
an axially slidable ring circumscribing the ring containing the fingers, so that sliding of the slidable ring over and along the fingers presses the fingers radially inwardly towards the first end piece when the two end pieces are in coupled arrangement thereby locking the fingers to the first end piece conical outer surface and against radial outer displacement to secure the two end pieces against separation when tension is applied to the end pieces when joined into operative coupled arrangement.

4,405,164

RATTLE-FREE DOOR LATCH

Christian L. Lint, 7800 Perimeter Rd. South, Seattle, Wash. 98108, and Robert S. Lint, 1509 Logan Ave., Seattle, Wash. 98199

Filed Sep. 12, 1980, Ser. No. 186,452
Int. Cl.³ E05C 1/12; E05B 3/00, 15/02
U.S. Cl. 292—169.21 19 Claims



1. A door latch comprising:

a casing for a bolt and bolt-retracting mechanism;

a spindle passing through said casing for operating said mechanism responsive to turning of the spindle;

two escutcheon assemblies at opposite sides of said casing

and having said spindle passing centrally therethrough, said escutcheon assemblies each comprising an escutcheon, a thrust washer, an outwardly facing thrust face, and an alignment member extending through the escutcheon to said casing;

two thrust roller bearings surrounding the spindle and engaging said outwardly facing thrust faces;

a first handle assembly on one end of the spindle;

a second handle assembly adjustably mounted on the other end of the spindle;

said handle assemblies presenting two respective, inwardly facing, annular thrust faces engaging respective of said bearings; and

tightening means for adjusting the position of said second handle assembly along the spindle for forcing said inwardly facing thrust faces tightly against said bearings and the latter, in turn, tightly against said outwardly facing thrust faces.

4,405,165

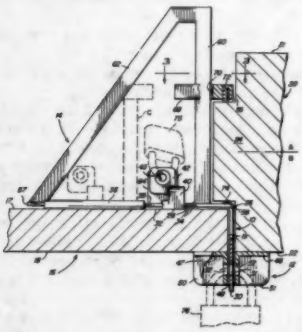
TEMPORARY DOOR LOCKING DEVICE

Blair E. Johns, 1002 N. 91st Ave., Tolleson, Ariz. 85353

Filed Mar. 23, 1981, Ser. No. 246,241

Int. Cl.³ E05C *19/18*

U.S. Cl. 292—258 **16 Claims**



1. A device for demountable attachment to a door for temporary locking thereof with the door being of the type which is hingedly mounted in a door jamb having a protruding door stop shoulder, the door having opposed planar surfaces and a vertical edge which is spaced from the door jamb and defines a crack therebetween when the door is closed, said device comprising:

(a) a door engaging member including means for engaging one of the planar surfaces of the door and tongue means for protruding from the crack between the door and the door jamb when the door is closed;

(b) a collar plate for demountable mounting on the tongue means of said door engaging member for overlaying at least a portion of the opposite planar surface of the door;

(c) first locking means;

(d) means on said collar plate and on the tongue means of said door engaging member for demountably receiving said first locking means by which removal of said collar plate from the tongue means of said door engaging member is prevented;

(e) a door jamb engaging member mounted on said door engaging member for sliding movement toward and away from the door jamb when the door is closed;

(f) gripping means mounted on said door jamb engaging member for demountably attaching said door jamb engaging member to the door jamb when the door is closed and said door jamb engaging member is slidably moved toward the door jamb;

(g) second locking means; and

(h) means formed on said door engaging member and on said door jamb engaging member for demountably receiving said second locking means when said door jamb engaging member is slidably moved toward the door jamb to prevent its movement away from the door jamb.

4,405,166

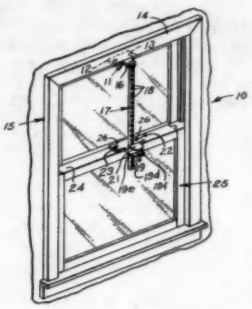
ENERGY SAVING WINDOW LOCK

Luis H. Lovis, 2002 Briscoe Ave., Artesia, N. Mex. 88210

Filed Apr. 17, 1981, Ser. No. 255,108

Int. Cl.³ E05C *17/20*

U.S. Cl. 292—305 **6 Claims**



1. An energy saving lock, comprising, in combination, a lower mounting plate, secured to the upper horizontal member of the lower window of a pair, a sleeve secured pivotally to said lower mounting plate, a toothed rod telescopingly received in said sleeve, a hand lever pivotally received on said sleeve, for engaging said toothed rod, and an upper mounting plate secured to the upper horizontal member of the window frame, for removably receiving the free end of said toothed rod.

4,405,167

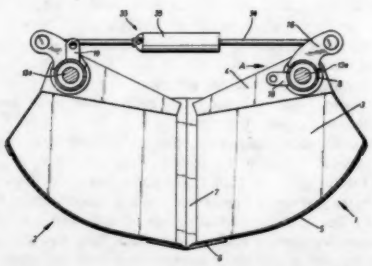
CLAMSHELL

Alfred Kinshofer, Wendelsteinstrasse 8, 8160 Miesbach/BRD, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 238,060

Int. Cl.³ B66C *3/02*

U.S. Cl. 294—70 **7 Claims**



1. A clamshell comprising a U-shaped halfscoop carrier including a central crosspiece and depending side legs terminating in parallel crossarms having bearing bores formed proximate their ends, a pair halfscoops having side walls and swingable about parallel axes extending between corresponding end sections of said crossarms, an actuating lever secured to said halfscoops, a hydraulic actuator including a piston rod con-

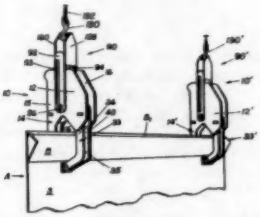
nected to one of said levers and a cylinder connected to the other of said levers, a tube having a bore and extending the upper border of each of said halfscoop sidewalls and having formed proximate its ends a slot extending for part of the periphery of the tube, the ends of each of said crossarms extending through respective slots with said bearing bores being in alignment with said bores in said tubes, said side walls having bores registering with the bores in said tubes and said crossarms, and pivot pins engaging said aligned crossarm bores and tube bores.

4,405,168

CLAMPING ASSEMBLY FOR LIFTING HEAVY OBJECTS HAVING A BULBOUS ENGAGEMENT PORTION

Eldred N. Fritzsche, Kirkwood; Edgar F. Josephson, St. Charles, both of Mo., and Frank C. Pulcrano, Huntington, W. Va., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 13, 1980, Ser. No. 206,418
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—103 R **33 Claims**



1. A clamping assembly for lifting heavy objects having a bulbous engagement portion comprising: a pair of clamping arms extending outwardly from a clamp base portion; each arm including a cutaway portion to receive the bulbous engagement portion of the article to be lifted, and a front gripping portion to engage and grip a non-bulbous portion of the article; at least one of said arms being movable and being pivotably mounted about the base portion for movement between a clamping position in which the gripping portion of the arms engage and grip the non-bulbous portion of the article to be lifted, and an open position wherein the gripping portion of the movable arm is located away from the gripping portion of the other arm to allow entry or removal of the article; drive means mounted on said base portion to move said movable arm between open and closed positions; said base portion being pivotably mounted about a crane support whereby the clamp assembly may be used in any direction; said crane support including means to support the clamp assembly by means of cable extending from an overhead crane; and safety means provided whereby said drive means cannot be activated unless the bulbous portion of the article to be lifted is located within the cutout portions of the fixed and movable arms and engages a contract member.

4,405,169

FARM WAGON

Rene Allard, Victoriaville; Fernand Couture, Sherbrooke, and Raynald Couture, Granby, all of Canada, assignors to La Compagnie Normand Ltee, St-Pascal, Canada

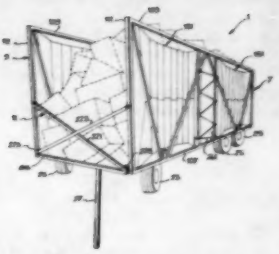
Filed Mar. 23, 1981, Ser. No. 246,207
Int. Cl.³ B60P *3/00*
U.S. Cl. 296—3 **14 Claims**

1. A platform for a farm wagon, said platform comprising:

a deck, the deck including a set of bottom frame members defining a first plane, and a set of top members defining a second plane, said top frame members being movably supported by the bottom frame members such that said first and second planes are substantially parallel;

a first pair of opposed side walls connected to the bottom frame members and a second pair of opposed side walls connected to the top frame members;

means for fastening said first pair of side walls to said second pair of side walls to indirectly fasten said top frame members to said bottom frame members whereby said top and



bottom frame members are held in position by said first and second pairs of side walls, yet are movable relative to one another when flexed;

a set of deck panels supported on the top frame members; and

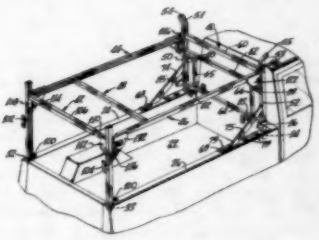
means for maintaining the deck panels on the top frame members such that said deck panels can move relative to said top frame members when said deck is flexed.

4,405,170

DEMOUNTABLE CARRIER RACK ASSEMBLY FOR PICKUP TRUCK

Ruben N. Raya, 964 West Brook, Santa Ana, Calif. 92703

Filed Aug. 3, 1981, Ser. No. 289,305
Int. Cl.³ B60P *3/42*
U.S. Cl. 296—10 **16 Claims**



1. In a carrier rack assembly for use in combination with the sidewalls of a pickup truck bed, the sidewalls having stake holes adjacent to corners thereof, the combination comprising:

a primary framework configured for securing to the sidewalls adjacent the front end of the pickup truck bed, the primary framework having first and second generally upright chassis post members configured for being received within the stake beds adjacent the front corners of the bed;

a secondary structural framework removably mountable to the sidewalls of the truck bed adjacent to the rear thereof, said secondary framework having first and second generally upright chassis post members configured for being received within the stake holes adjacent to the rear corners of the bed when assembled thereon, said chassis post members of said secondary framework being in general alignment with the chassis post members of said primary

framework, said secondary framework is of an inverted generally U-shaped configuration having cross member means adjacent the upper ends of said secondary framework chassis post members, and said primary framework includes means for releasably receiving said secondary framework thereon when removed from the rear stake holes;

first and second generally elongate members, each having means at opposite ends thereof for removably affixing to the upper ends of aligned ones of said chassis post members of each sidewall, each of said generally elongate members being a mirror image of the other, and the means at opposite ends of an elongate member include means configured for coaction with the interior of a sidewall for storage of the elongate member within the truck bed; and

adjustable load bar means transversely extending between said elongate members.

4,405,171

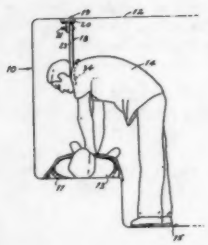
OVERHEAD AMBULANCE ATTENDANT STABILIZING DEVICE

Arnold F. Payne, W. 1724 York, Spokane, Wash. 99205; Gene A. Mauro, E. 14016 Mallon, Spokane, Wash. 99216; Wayne L. Cumpton, 4923 Powell Rd., Newman Lake, Wash. 99025, and George J. Orr, 13422 E. 6th, Spokane, Wash. 99216

Filed Dec. 28, 1981, Ser. No. 334,525

Int. Cl.³ B60P *3/26*; A61B *19/00*

U.S. Cl. 296—19 **12 Claims**



1. An overhead ambulance attendant stabilizing device for restraining a medical attendant within an ambulance having an overhead roof structure while the attendant is administering cardiopulmonary resuscitation to a patient lying on an ambulance bed while the ambulance is in transit, comprising:

bracket means for mounting the device to the overhead roof of the ambulance overlying the ambulance bed;

two elongated shoulder arms pivotally connected to the bracket means for movement between elevated outstretched horizontal storage positions adjacent the ambulance roof and depending operating positions projecting downward from the bracket toward the ambulance bed;

means for securing the two shoulder arms in the storage positions and in the depending operating positions;

shoulder pad means operatively mounted to the two shoulder arms for engaging the medical attendant's shoulders to restrain movement of the attendant with respect to the ambulance bed while the attendant is administering cardiopulmonary resuscitation to the patient on the ambulance bed.

4,405,172

HIGH DECK AMBULANCE CART

Richard H. Ferneau, Washington Court House, Ohio, assignor to Marianne Adler, San Diego, Calif.

Filed Oct. 21, 1981, Ser. No. 313,375

Int. Cl.³ A61G *1/02*

U.S. Cl. 296—20 **13 Claims**

1. A multi-level ambulance cart comprising,

an upper frame forming a bed,

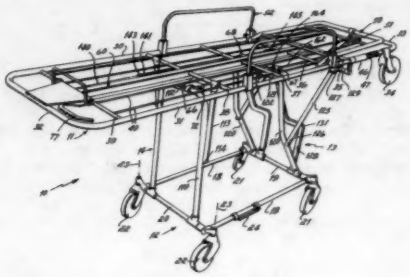
a lower frame,

wheels supported on said lower frame,

forward and rearward vertical legs connecting said upper frame to said lower frame with said lower frame approximately centered below said upper frame,

means pivotally mounting said legs to said lower frame,

means pivotally and slidably mounting said legs to said upper frame,



means for locking the upper ends of said legs selectively in a transport position in the center portion of said cart and in home bed position toward the rear of said cart,

and means maintaining said lower frame approximately centered below said upper frame as said slidable mounting means are shifted between said two positions.

4,405,173

MOTOR VEHICLE DOOR ASSEMBLY

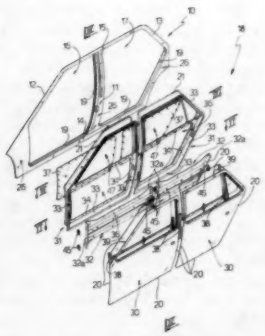
Renzo Piano, Paris, France, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 13, 1981, Ser. No. 263,135

Claims priority, application Italy, May 20, 1980, 67795 A/80

Int. Cl.³ B60J *5/00*

U.S. Cl. 296—146 **10 Claims**



1. A door assembly for the side closure of the passenger compartment of a motor vehicle comprising a carrying structure having a mechanical resistance function and provided with at least two sides, each of which comprises at least three substantially vertical stanchions and two substantially horizontal side members connected to one another, a door being hinged to at least one of the said stanchions of the respective side, characterized in comprising a frame having three substantially vertical stanchions and two substantially horizontal side members and arranged to be superimposed sideways on a corresponding side of the said carrying structure, the configuration of the said frame being such that the said stanchions and

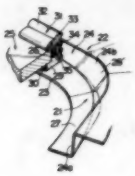
the said side members of the said frame may be superimposed on the corresponding stanchions and side members of the said side, each of the said frames being provided with continuous abutment surfaces formed on the said stanchions and the said side members and arranged to provide a continuous abutment for the rims of a door when these latter are in their closure position.

4,405,174

WINDOW STRUCTURE OF A VEHICLE BODY

Yukio Yamane, Yokosuka; Kazuhiko Yoshiyuki, Yokohama, and Toshiaki Endo, Chigasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 1, 1981, Ser. No. 259,584
Claims priority, application Japan, May 7, 1980, 55-59406
Int. Cl.³ B62D *27/00*
U.S. Cl. 296—201 **1 Claim**



1. A window structure of a vehicle body, comprising:

an inwardly offset flange structure defining a window opening therein, the inwardly offset flange structure including inwardly bent walls which have substantially straight wall portions and curved corner wall portions each merging into adjacent two of the straight wall portions;

a window panel secured to said flange structure for closing said window opening, the window panel having an edge wall which includes a plurality of substantially straight edge wall portions respectively spaced apart from said straight wall portions and a plurality of curved corner edge wall portions each merging into adjacent two of the straight edge wall portions and respectively spaced apart from said curved corner wall portions, each of said straight edge wall portions and each of said straight wall portions forming a straight gap therebetween, and each of said curved corner edge wall portions and each of said curved corner wall portions forming therebetween a curved corner gap which merges into the adjacent two of the straight gaps and which is at least partially smaller in width than each of said straight gaps;

an adhesive compound interposed between the outer peripheral surface of said flange structure and the inner peripheral surface of said window panel for bonding the outer peripheral surface of said flange structure and the inner peripheral surface of said window panel; and

a reveal molding comprising a decorative trim portion bridging said vehicle body and said window panel, a stem portion integral with said decorative trim portion and extending in said straight and curved corner gaps, said stem portion having at its inner end an arrow-shaped bead embedded in said adhesive compound for preventing said stem portion from being dislodged out of said straight and curved corner gaps, and a plurality of retrorse fins extending outwardly from both sides of said stem portion and angled toward said decorative trim portion for engagement with said bent walls of said vehicle body and said edge wall of said window panel;

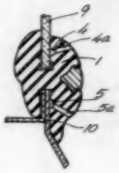
in which each of said curved corner gaps has an outer end extending on the same plane as the outer surface of said window panel and an inner end extending on the same plane as the inner surface of said window panel, each of said curved corner wall portions having an outer face inclined with respect to and away from the end face of each of said curved corner edge wall portions in such a manner that each of said curved corner gaps is smaller in width at the inner end than at the outer end thereof.

4,405,175

RESILIENT SEALING FRAME FOR THE FRONT AND REAR WINDOWS OF A VEHICLE

Elmar Hoffmann, Munich, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,134
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040126
Int. Cl.³ B62D *27/02*
U.S. Cl. 296—201 **5 Claims**



1. A resilient sealing frame adapted to extend continuously around the periphery of a vehicle window for location between the window and the vehicle body, the sealing frame including:

A continuous slot for snugly accommodating the peripheral margin of a window,

a continuous groove in one wall of the slot facing a surface of the window, the groove being flanked by prominent lips adapted to seal against the surface of the window, the open side of the groove being closed by the surface of the window which it faces,

a pair of holes extending from the groove to the exterior surface of the sealing frame, and

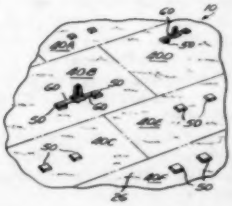
a resilient cement filling the length of the groove between the holes.

4,405,176

METHOD FOR HYDRAULICALLY MINING UNCONSOLIDATED SUBTERRANEAN MINERAL FORMATIONS USING REMOTE SUPPORT

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Mar. 16, 1981, Ser. No. 243,819
Int. Cl.³ E21C *45/00*
U.S. Cl. 299—17 **5 Claims**



1. A method of hydraulically mining a subterranean mineral formation to prevent adverse bending of the mining tool apparatus during the mining operation comprising the steps of:

determining the anticipated maximum diameter of a mining cavity to be hydraulically formed within the subterranean mineral formation;

delineating the ground surface of said subterranean mineral formation into a plurality of mining zones each of said zones having a surface area greater than said anticipated maximum diameter of the mining cavity;

positioning a hydraulic mining tool apparatus within at least one of said mining zones at a location vertically aligned with the desired location of the mining cavity to be formed in the subterranean formation;

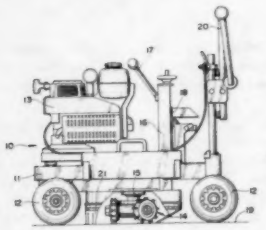
supporting the weight of said mining tool apparatus upon said ground surface at a lateral distance spaced from said vertically aligned location; and

hydraulically mining said subterranean mineral formation beneath said vertically aligned location to form said mining cavity while isolating the compressive weight of said mining tool apparatus from said vertically aligned location.

4,405,177
APPARATUS FOR FINISHING SURFACES

Hiroyuki Yamashita, Tokorozawa, Japan, assignor to Y K Trading Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,078
Int. Cl.³ B24B *23/00*; E01C *23/00*
U.S. Cl. 299—41 **9 Claims**



1. A rotor assembly for finishing a surface, comprising:

a rotor drivably rotatable within a first plane which is substantially parallel to the surface to be finished, said rotor being drivably rotatable about a first axis which is substantially perpendicular to said surface;

three rotary scrapers individually supported on said rotor for free rotation in second planes which are substantially perpendicular to said first plane, said three rotary scrapers being disposed in a circular array about said first axis so that said three rotary scrapers are angularly spaced substantially 120° apart from one another;

each said rotary scraper being supported for free rotation on said rotor about a second axis which is substantially perpendicular to but does not intersect said first axis, said second axis being positioned closely adjacent and in parallel relationship to a radial line which projects perpendicularly outwardly from and intersects said first axis, said second axis being spaced rearwardly from the respective adjacent radial line with respect to the direction of rotation of said rotary;

each said scraper having a plurality of scraper tips mounted thereon circumferentially therearound, said scraper tips extending radially from the respective scraper for scraping contact with the surface;

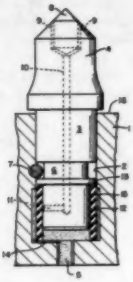
said rotor being of a substantially cylindrical construction and including upper and lower rotor portions connected together by threaded fasteners with elastomeric dampers being interposed between said upper and lower rotor portions, said rotary scrapers being freely rotatably supported on said lower rotor portion; and

drive shaft means nonrotatably coupled to said upper rotor portion.

4,405,178
CUTTER BIT FOR A MINING MACHINE

Helmut Brandenburg, Sprockhovel, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,480
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021821
Int. Cl.³ E21C *35/22*
U.S. Cl. 299—81 **7 Claims**

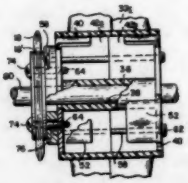


1. A bit assembly for a mining machine cutter head comprising a bit having a shank portion reciprocable within a bore formed in a bit holder, the innermost end of the shank portion being of diameter less than the bore to form a shoulder area at the transition between said innermost end and the remainder of the shank portion, a passageway in the bit for conducting fluid to nozzle means at the forward end of the bit, radial bore means connecting said passageway to the peripheral surface of said innermost end of the shank portion, means for conducting fluid under pressure to the bottom of the bore in said bit holder, and a resilient sleeve surrounding said innermost end of the shank portion to normally seal said radial bore means against fluid flow, the sleeve extending between said shoulder area and a point beyond said innermost end of the shank portion whereby movement of the bit toward said bottom of the bore will deflect the resilient sleeve to permit fluid to flow from said bottom of the bore through said radial bore means and said passageway to said nozzle means.

4,405,179
UNIVERSAL VELOCIPEDE WHEEL

Robert J. Boudreau, and Joel C. Cunard, both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.

Filed Mar. 31, 1981, Ser. No. 249,398
Int. Cl.³ B60B *37/00*
U.S. Cl. 301—2.5 **6 Claims**



1. A wheel capable of use as the front or rear wheel of a sprocket-driven velocipede as well as the front wheel of a pedal-driven tricycle, said wheel comprising

A. a unitary molded plastic wheel section composed of

(1) a wheel rim,

(2) a central hub, and

(3) an array of spokes connecting the rim and hub, said hub including

(a) an axle tube,

(b) a second tube of appreciably larger diameter than the axle tube coaxially surrounding the axle tube, and

(c) an array of ribs connecting the two tubes and defining therewith an array of passages extending axially through the hub between the tubes, and

B. a pair of flat, rigid plates positioned against the opposite ends of the axle tube, said plates having

(1) unobstructed axial openings aligned with the opening through the axle tube and sized to snugly receive a rod that forms an axle or a rod that forms an axle or a pedal crank,

(2) an outer diameter less than the inner diameter of the second tube and sized to be snugly received therein, and

(3) a plurality of arcuate tabs projecting laterally from the faces of the plates at their peripheries into selected ones of said hub passages adjacent the junction of the second tube and the ribs defining those passages, and at least one of said plates having means to facilitate its connection to a sprocket, and

C. fastener means extending between the plates through selected ones of said hub passages for clamping the plates to the hub so that when the plates are rotated, torque is coupled by the plate tabs to the wheel section at locations spaced from the wheel axle and adjacent to the hub second tube.

4,405,180

WHEEL HUB FOR TWO-WHEELED VEHICLES

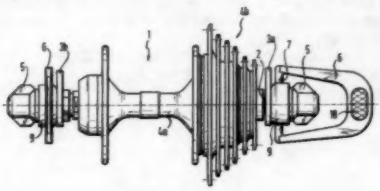
Hans Butz, Schwebheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,298

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113439

Int. Cl.³ B62K *25/02*

U.S. Cl. 301—111 **10 Claims**



1. Wheel hub for two-wheeled vehicles, such as the rear wheel of a bicycle, comprising a hub axle, a hub sleeve coaxial with and rotatably supported on said hub axle, and quick-clamping means for securing said hub axle in the frame of a two-wheeled vehicle, wherein the improvement comprises that said quick-clamping means comprises a clamping unit at each of the opposite ends of said hub axle outwardly from the opposite ends of said hub sleeve, each said clamping unit comprises a nut and a thrust ring located inwardly of said nut, said thrust ring being movable to a limited extent in the axial direction of said hub axle, each said nut and thrust ring having a bearing surface area disposed in facing relationship and spaced apart in the axial direction of said hub axle, and a clamping member pivotally mounted between said bearing surface areas, and said clamping member including at least one eccentric cam located between and in contact with said bearing surface areas, said eccentric cam being pivotally displaceable relative to said bearing surface areas for selectively axially moving said thrust ring relative to said nut for locking and unlocking said quick-clamping means.

4,405,181

BRAKE VALVE

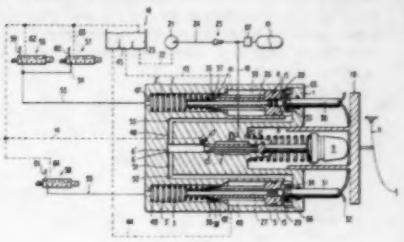
Reinhard Resch, Stuttgart, and Helmut Krohn, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,386

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015729

Int. Cl.³ B60T *13/14*

U.S. Cl. 303—9 **9 Claims**



1. A brake valve used in connection with an anti-locking means for a vehicle brake system and actuated by means of a brake pedal against a return force of a path-simulation spring, comprising a slide valve means for shifting by operation of the brake pedal and for controlling pressure admission of a wheel brake cylinder or a dosaging of a pressure medium led from a pressure source to the wheel brake cylinders, said cylinders also controlled by blocking valves, the slide valve means controlling a pressure medium supply to inlet pressure chambers of emergency pistons, outlet pressure chambers of which, by means of the blocking valves, are connected to the wheel brake cylinders, at least two emergency pistons being provided, of which each, in the case of a breakdown of the pressure medium supply, being operated mechanically by the brake pedal, each emergency piston having a central pressure-medium duct leading from the inlet pressure chamber to the outlet pressure chamber, by means of which, during normal braking, the pressure source is connected to the outlet pressure chambers of the emergency pistons and, by the blocking valves, connected at the outlet side of said emergency pistons, being connected to the wheel brake cylinders; and during breakdown of the pressure-medium supply, these pressure-medium ducts penetrating the emergency pistons being blocked by means of valves closable by brake pedal action and the emergency pistons being operated together whereby wheel brake cylinders of the vehicle brake system are individually controlled.

4,405,182

CONTROL VALVE ARRANGEMENT FOR COMBINED BRAKE CYLINDER AND AIR RESERVOIR DEVICE

James E. Hart, Trafford, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Sep. 8, 1981, Ser. No. 300,705

Int. Cl.³ B60T *8/18, 15/42*

U.S. Cl. 303—23 R **78 Claims**

1. Fluid pressure brake apparatus for a railway vehicle operative in response to variation of fluid under pressure in a brake pipe of said vehicle comprising:

(a) a brake cylinder device having:

(i) a power cylinder portion;

(ii) a power piston operatively disposed in said power cylinder portion and cooperating therewith to form an application chamber on one side of said power piston and a release chamber on the opposite side thereof;

(iii) a positioning cylinder portion;

(iv) a positioning piston operatively disposed in said positioning cylinder portion for engagement with said power piston, said positioning piston cooperating with

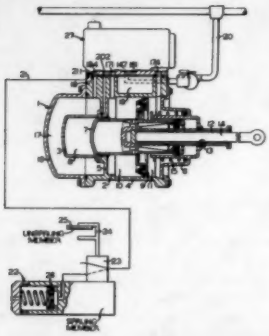
said positioning cylinder portion to form on one side thereof a positioning chamber;

(v) biasing means for urging said power piston toward a brake release position; and

(b) a control valve device including

(i) an exhaust passage;

(ii) charging valve means having a charging position in which said positioning chamber is vented and said application and release chambers are in fluid pressure communication with said brake pipe, whereby said bias means is effective to move said power piston to said brake release position and having a cut-off position in which said venting of said positioning chamber and said charging of said application and release chambers is interrupted;



(iii) service valve means operable to an application position in response to a reduction of said brake pipe fluid under pressure for operating said charging valve means to said cut-off position and for conducting flow of fluid under pressure from said release chamber to said positioning chamber, said positioning piston and accordingly said power piston being movable from said brake release position to a brake application position when the fluid under pressure in said positioning chamber reaches a predetermined value; and

(iv) transfer valve means operatively responsive to said release chamber fluid under pressure for establishing fluid pressure communication between said release chamber and said exhaust passage to thereby establish a pressure differential between said application and release chambers to cause said power piston to provide a braking force.

4,405,183

VEHICLE BRAKE VALVE WITH AN EMERGENCY PISTON

Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

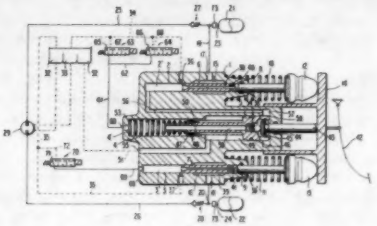
Filed Apr. 24, 1981, Ser. No. 257,324

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015689

Int. Cl.³ B60T *8/02, 15/02*

U.S. Cl. 303—119 **9 Claims**

1. A brake valve arrangement for a vehicle braking system operable by a brake pedal and monitored by an anti-locking means, the arrangement comprising a control valve means for metering a feed of pressure medium from a source of pressure medium to wheel brake cylinders of the braking system, the control valve means includes a first and second control slide valve, means are provided for respectively connecting the first and second control slide valves with separate pressure reservoir means forming the source of the pressure medium, an emergency piston means is cooperable with one of the control slide valves for enabling a free through-flow of pressure medium during a normal operation of the brake system, means are provided for blocking the through-flow of pressure medium upon a failure of the source of pressure medium and an emptying of the pressure reservoir means such that the emergency piston means is mechanically operable by the brake pedal, spring means are interposed between the brake pedal and first and second control slide valves, the anti-locking means includes anti-lock valves arranged at the wheel cylinders for relieving the pressure medium, the emergency piston means



includes a longitudinally extending central bore through which the pressure medium flows during a normal operation of the brake system, the blocking means includes a spring loaded ball valve means for controlling an opening of the central bore, and a tappet means interposed between the brake pedal and ball valve means for urging the ball valve means into a closed position against a valve seat upon an interruption in a supply of pressure medium from the source of pressure medium, and the brake valve having an anti-locking mechanism that operates with pressure control at the wheel brakes by draining brake fluid from the wheel brake cylinders.

4,405,184

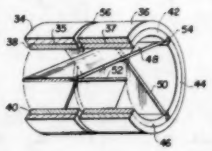
UNIDIRECTIONAL FLEXURAL PIVOT

Hossein Bahiman, Landover Hills, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 243,684

Int. Cl.³ F16C *11/12*

U.S. Cl. 308—2 A **11 Claims**



1. A unidirectional flexural pivot, comprising:

a pair of pivot means (**34, 36**) located adjacent one another and generally coaxially aligned and mutually rotatable around a central axis, said pivot means being spaced apart on opposite sides of a single plane transversing said central axis and having respective inner and outer wall surfaces and a plurality of attachment points (**54**) located along said inner wall surfaces; and,

a plurality of substantially straight, thin flexible spring element (**48/50/52**) having opposed flat surfaces extending along a fixed direction of slant relative to the central axis and single plane between said inner wall surfaces of said pair of pivot means and joined at opposite ends (**49, 51**) of said flat surfaces to said pair of pivot means (**34, 36**) at a non-diametrically opposing pair of said attachment points (**54**) located on said inner wall surfaces (**35, 37**) of different

ones of said pivot means wherein said attachment points of said spring elements are axially aligned in pairs on said adjacent pivot means, whereby each of said flat surfaces defines a plane parallel to said central axis and perpendicular to said single plane when said pair of pivot means are at rest and forms a curved surface perpendicular to said single plane and bowed outwardly from said central axis when one of said pivot means is rotated relative to the other of said pivot means in said direction of slant.

4,405,185

ROLLER BEARING

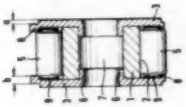
Jürgen Oetjen, Herzogenaurach, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,843

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048228

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **5 Claims**



1. A roller bearing for the longitudinally moveable mounting of an element with a straight race comprising a bearing body having two race sections of which at least one is straight, the two race sections being connected at their ends to each other by a curved race section at each end to form a closed race for cylindrical rolling element being secured by retaining means against falling out, the race being laterally bounded by separate flange plates secured to the bearing body, the flange plates being thin-walled elements having, in at least part of the race area, chiplessly formed on rims, being formed in such a way that the material in the area of the rims is offset by a partial amount of the thickness of the flange plates parallel to the latter and towards the race.

4,405,186

MOVABLE GRID STACKER FOR A FOOD SLICING MACHINE

Glenn A. Sandberg, Lockport, and Scott A. Lindee, New Lenox, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Oct. 5, 1981, Ser. No. 308,252

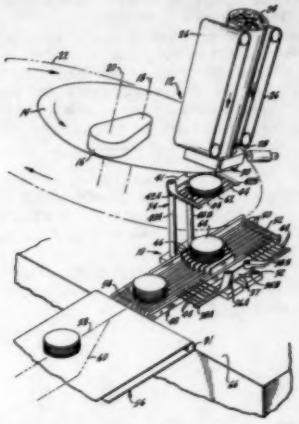
Int. Cl.³ B26C *7/30, 7/32*

U.S. Cl. 414—21 **8 Claims**

1. A stacker for a food loaf slicing machine of the kind in which a food loaf is advanced generally downwardly into a slicing station in which slices of generally uniform thickness are cyclically sliced from the lower end of the loaf, forming stacks of N slices, the stacker comprising:

first and second pairs of opposed stack supports, the stack supports of each pair each being movable along a predetermined closed-loop path from an initial slice receiving position immediately below the slicing station at which the stack support pair receives a first food loaf slice as cut with essentially no free fall, downwardly through a range of N−1 additional slice receiving positions each displaced approximately one additional slice thickness downwardly from the slicing station, further downwardly to a discharge position displaced from the final slice receiving position, pivotally outwardly of the discharge position, upwardly to a ready position adjacent to the initial slice receiving position, and pivotally inwardly to the initial slice receiving position;

stack support drive means, operatively connected to the first and second pairs of stack supports, for moving each pair of stack supports through its closed-loop path in 2N slicing cycles, with the second pair of stack supports moving from the ready position to the initial slice receiving position immediately after the first pair of stack supports moves from the final slice receiving position toward the discharge position sufficiently to afford clearance from the top slice of a stack on the first pair of stack supports;



and stack discharge means for removing a stack of slices from each pair of supports, at the discharge position, with no free fall.

4,405,187

CONNECTOR ASSEMBLY FOR PCM CABLES

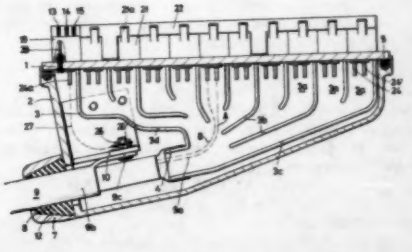
Manfred Müller, and Klaus-Peter Achtnig, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,248

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021283

Int. Cl.³ H01R *13/512*

U.S. Cl. 339—14 R **13 Claims**



1. A connector assembly for pulse-code modulation cables, said connector assembly being electrically shielded, said assembly comprising:

a generally rectangular electrically conductive base plate having top and bottom surfaces;

a plurality of contact pin pairs extending through said base plate and having top and bottom ends, said contact pins

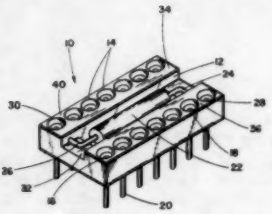
being mounted to said base plate in a pressure sealed and electrically insulated manner;
a like plurality of electrically insulative housings mounted to said top of said base plate and accommodating one of said contact pin pairs;
metal shielding means on each said insulative housing;
a plurality of contact elements in each said housing;
means in each said housing to couple said contact elements individually with the top ends of said contact pins;
metal shielding means extending generally downwardly from the bottom of said base plate in the form of a plurality of partitions forming chambers in each of which reside the bottom ends of one of said contact pin pairs; and
means adapted to receive said cable so that pairs of conductors from said cable are connectable to the bottom ends of said contact pin pairs.

4,405,188

ELECTRICAL SOCKET WITH DISCREET IMPEDANCE ELEMENT ATTACHED THERETO

William B. Schwartz, New Brunswick, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 6, 1981, Ser. No. 251,580
Int. Cl.³ H01R *9/09, 13/66*
U.S. Cl. 339—17 CF **6 Claims**



1. An electrical termination system comprising:
an insulator block having a pair of primary holes drilled therethrough, said primary holes each receiving an electrical socket contact; said socket contacts each having rigid exterior portions and hollow pin receiving portions located within the confines of said primary holes;
a secondary hole associated with each primary hole and each secondary hole formed as a bulge extending sidewardly from the periphery of the associated primary hole;
a discrete electrical impedance element having a pair of leads; each of said secondary holes receiving a corresponding electrical lead of said impedance element; each of said rigid exterior portions of said contacts and said leads forming an interference fit with one another therebetween, said secondary holes being configured to closely surround the inserted leads.

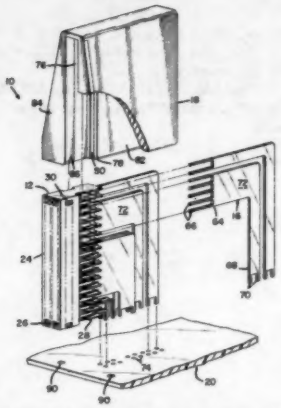
4,405,189

NARROW PROFILE POWER DISTRIBUTION BLOCK

George H. Douty, Mifflintown; Leon T. Ritchie, Mechanicsburg, and Clair W. Snyder, Jr., York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 13, 1981, Ser. No. 292,565
Int. Cl.³ H01R *23/68*
U.S. Cl. 339—17 C **5 Claims**

1. A narrow profile connector for bussing power to circuit boards and the like without utilizing any substantial amount of real estate on the circuit board, comprising:
a connector housing of rigid insulative material having a plurality of terminal passages extending from a rear end through said housing to open on a front mating face, each passage being fully enclosed at the mating face and open channel shaped at the rear end;
a plurality of terminals each mounted in a respective one of said passages, each said terminal having a forward mating end directd toward said front mating face and lying in the fully enclosed portion of said passage and a conductor engaging slotted rear portion lying exposed in said open channel shaped portion;
a plurality of bussing members each having first and second ends extending normal to each other in the plane of the respective bussing member, at least one tine extending from each said end, first tines on said first end being engageable with the slotted rear portion of said terminals to



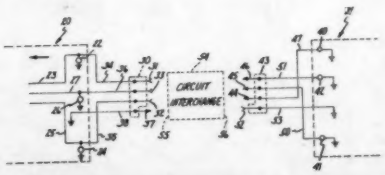
make electrical and mechanical contact therewith, second tines on said second end being engageable with circuitry of said circuit board, and
a housing shell of rigid insulative material having a central cavity defined by spaced parallel walls, said shell being profiled to mate with said connector housing and to enclose said bus members,
whereby said connector can be applied to an edge portion of a circuit board in an edgewise condition presenting a narrow profile while providing an adequate bussing for the necessary power.

4,405,190

CIRCUIT INTERCHANGE MODULE

John H. Schroeder, 1030 Jefferson St., Anoka, Minn. 55303

Filed May 11, 1981, Ser. No. 262,444
Int. Cl.³ H01R *29/00*
U.S. Cl. 339—28 **6 Claims**



1. An electrical circuit interchange for use with a land vehicle assembly having a towing vehicle and a towed vehicle, comprising: a socket member including a plurality of female connector elements arranged in equal orthogonally disposed rows; a male connector element disposed at the end of each of said rows; means electrically interconnecting said male connector element to form a first circuit; means electrically interconnecting selected female elements in said rows to form second, third, and fourth circuits such that the order of the circuits in each row, reading toward the male connector ele-

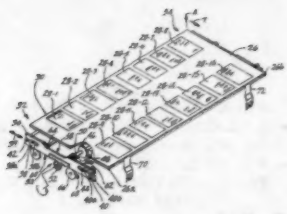
ment, is different from that in every other row, said circuits in said rows being arranged to provide alternative manners of joining electrical devices on said towing and towed vehicles by joining a mating connector to a selected one of said rows.

4,405,191

LOW INSERTION FORCE ACTUABLE INTERFACE FOR ELECTRICAL CONTACTS

Lyle A. Fettig, La Verne, Calif., assignor to Everett/Charles Test Equipment, Inc., Pomona, Calif.

Filed Oct. 17, 1980, Ser. No. 197,973
Int. Cl.[3] G01R 15/12; H01R 13/629
U.S. Cl. 339—75 M 22 Claims



1. A low insertion force actuable interface assembly having a carrier mounting an array of electrical contacts with axes of the contacts substantially parallel to each other so that each contact extends to a free end and a carrier moving means, the carrier moving means comprising at least one movable cam member guided for movement in a substantially straight line, the cam member comprising first and second cam portions, a cam follower connected to the carrier and positioned for following the first and second cam portions for thereby guiding the movement of the carrier during movement of the cam member, a first cam part connected for movement with the cam member, such movement of the cam member causing the cam follower to follow in sequence the first and second cam portions, the cam follower in following the first cam portion causing the carrier to move the contacts substantially parallel with the axes thereof, the second cam part forcing the first cam part to move the carrier substantially transverse to the axes of the contacts while the cam follower follows the second cam portion, the improvement comprising:

guide means for supporting and guiding the movable cam member along such substantially straight line comprising

at least one first bearing on the cam member,

at least one second bearing on the cam member,

at least one first roller positioned for supporting and rolling along the first bearing,

at least one second roller positioned for supporting and rolling along the second bearing,

an interlocked interface between the first roller and the first bearing for substantially preventing movement of the cam member transverse to such substantially straight line, the first and second bearings being at least partially oppositely facing, the first and second rollers being positioned with respect to the first and second bearing for supporting and guiding the cam member along such substantially straight line.

4,405,192

HERMAPHRODITIC CONNECTOR

Daniel G. Eaby, Mt. Joy, and John R. Shuey, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

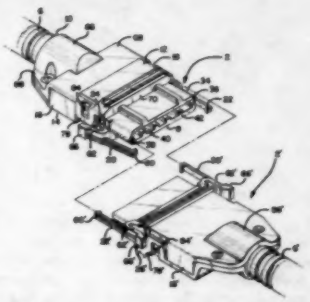
Filed Feb. 11, 1981, Ser. No. 233,543
Int. Cl.[3] H01R 13/633
U.S. Cl. 339—91 R 3 Claims

1. An electrical connector for matable engagement with a complementary electrical connector, comprising:

an insulating housing means having terminal passageways in which electrical terminal means are to be disposed for terminating electrical conductors, said housing means having sidewalls and a mating end for matable engagement with a like matable end of a complementary electrical connector;

latch means including latch arm means and engaging means;

spring means integrally connecting said latch means to side sidewalls of said housing means so that said latch arm means extend toward a front end of said housing means alongside the mating end while said engaging means extend toward a back end of said housing means, said latch means being on one side of a medial plane which includes a longitudinal axis of said housing means;



latching ear means on said sidewalls above said spring means of said latch means and being on the other side of said medial plane;

said housing means having a body member and a cover member, said latch means being on one of said members, said latching ear means being on the other of said members;

said latch arm means adapted to latchably latch onto said latching ear means when the matable ends of complementary electrical connectors are matably engaged, said engaging means when engaged and moved inwardly toward said sidewalls moving said latch arm means free of said latching ear means to enable the matable ends of the complementary electrical connectors to be disconnected.

4,405,193

PRELOADED ELECTRICAL CONNECTOR

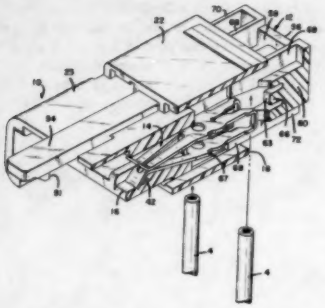
Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1981, Ser. No. 271,491
Int. Cl.[3] H01R 4/24
U.S. Cl. 339—99 R 3 Claims

1. An electrical connector assembly of the type comprising an insulating housing and a conductor retaining plug, said housing having a mating face, a conductor entry face, oppositely facing parallel sidewalls and oppositely facing parallel endwalls extending between said faces, at least one contact receiving cavity extending through said housing from said mating face to said conductor entry face, an electrical terminal in said cavity, said terminal having a conductor connecting portion which is proximate to said conductor entry face, said conductor connecting portion comprising at least one plate-like member which is parallel to said sidewalls, said plate-like member having a conductor-receiving slot having an open end which is directed towards said conductor entry face, said retaining plug being insertable into said housing at said conductor entry face and having retaining and conductor inserting projections thereon which are dimensioned to extend past said plate-like member and retain a conductor in said slot, said connector assembly being characterized in that:

said plug has spaced-apart parallel guide bars thereon ex-

tending beside, and beyond, said retaining and conductor inserting projections, said plug being partially inserted into said conductor entry face with said guide bars extending into the interior of said housing and with said retaining and conductor inserting portions spaced from said conductor connecting portion and spaced from said conductor entry face,



said guide bars and internal surface portions of said cavity having opposed shoulders thereon serving to hold said plug in said partially inserted position, whereby

upon positioning a conductor between said retaining projections and said plate like member and moving said retaining plug to its fully inserted position, said conductor will be moved into said slot by said retaining and conductor inserting projections.

4,405,194

ELECTRICAL PLUG

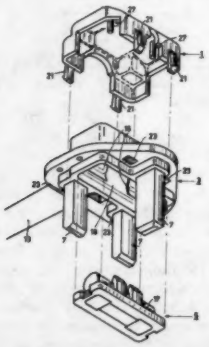
Dirk F. W. van Lierop, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,669

Claims priority, application Netherlands, Nov. 28, 1980, 8006481

Int. Cl.³ H01R *3/00*

U.S. Cl. 339—147 P **2 Claims**



1. An electrical plug comprising:

(a) a base including a front and a rear portion and having an opening extending from the front portion to the rear portion, said front portion having connection pins projecting therefrom and having a recess in which are disposed contacts for electrical connection to a fuse, and said rear portion having terminals electrically-connected to respective ones of the connection pins;

(b) a connection cable including wires electrically connected to respective ones of the terminals;

(c) an insulating cap for attachment to the rear portion of the base to cover at least one of the terminals, said insulating cap including a pin for projecting into the opening when the cap is attached to the base; and

(d) an injection molded plug body of plastic material for covering the rear portion of the base and the insulating cap;

said opening communicating with the recess, and said cap's pin serving as means to prevent the plastic material from flowing into the recess if the insulating cap is attached when the plug body is injection molded.

4,405,195

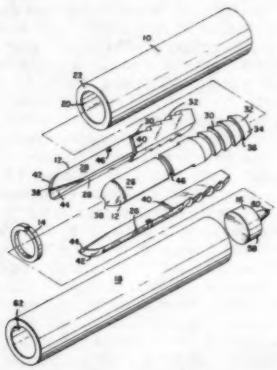
PIN AND SOCKET CONNECTOR

Hitesh Cherry, Harrisburg; Arthur L. Mueller, Camp Hill, and Walter M. Werner, Downingtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 29, 1981, Ser. No. 258,710

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—252 R **4 Claims**



1. A pin and socket connector of the type formed by the pin being telescopingly received in the socket, said connector comprising:

a. a elongated pin of conductive material having cable receiving means at one end and cylindrical socket insertion means comprising a plurality of spring beams at the opposite end with the free ends of the beams collectively defining a tapered opening therebetween, and further, a groove encircling the circumference of the insertion means at a location spaced rearwardly from the free end thereof;

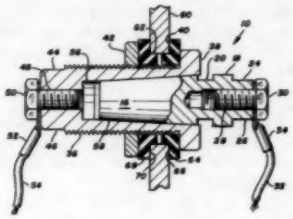
b. a compressible ring positioned in the groove with a portion of the ring extending above the surface of the pin when in a non-compressed state; and

c. en elongated socket having cable receiving means at one end and a receptacle at the opposite end adapted to receive the insertion means of said pin with the wall of the receptacle having a circumferential groove opening out into the receptacle and further a cone-shaped member positioned in the receptacle so that upon inserting the insertion means into the receptacle the ring becomes compressed until reaching the groove whereupon it expands thereinto to lock the pin in the socket and the cone-shaped member enters the tapered opening and thereby causes said beams to expand outwardly against the wall of the receptacle.

4,405,196
ELECTRICAL CONNECTOR FOR HIGH FIDELITY AUDIO EQUIPMENT

Robert W. Fulton, 4428 Zane Ave. North, Minneapolis, Minn. 55422

Filed Jan. 12, 1981, Ser. No. 224,083
Int. Cl.³ H01R 11/04
U.S. Cl. 339—273 F 5 Claims



1. A separable electrical connector for joining at least two components of a high fidelity audio system to one another, comprising:

(a) a first connector member of a first predetermined mass having a solid, frusto-conical portion of a predetermined length integrally joined at its larger base with a coaxial cylindrical portion of a lesser diameter than said larger base of said frusto-conical portion, said cylindrical portion having a coaxial threaded bore extending inward from one end thereof;

(b) a second connector member of a second predetermined mass comprising a first generally cylindrical portion having a tapered bore extending inwardly from one end thereof for a predetermined distance greater than said predetermined length and terminating internally in a second cylindrical bore of a diameter equal to the diameter of the smallest diameter of said tapered bore, said tapered bore being dimensioned to receive the entirety of said frusto-conical portion of said first connector member therein with a predetermined interference fit, said cylindrical portion of said second connector member having a threaded bore extending inwardly from the other end thereof; and

(c) fastener means insertable into said threaded bores in said first and second connector members for connecting electrical wires respectively associated with said two components to said first and second connector members, the combined mass of said first connector member and said second connector member precluding resonance at sound frequencies above about 4 Hz.

4,405,197
OPTICAL FIBER TACTILE SENSOR

Antal K. Bejczy, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1980, Ser. No. 210,405
Int. Cl.³ G02B 5/14; A61F 1/00
U.S. Cl. 350—96.15 3 Claims

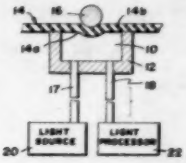
1. A tactile sensor comprising:

structure means including elastic means, and defining an array of a plurality of enclosed cells, each cell including a top side, defined by a surface area of a first surface of said elastic means, the latter having a second surface, opposite said first surface, said second surface being exposed and adapted to come in contact with an object whereby the height of a cell is affected by depression of said elastic means;

light source means;

first light conducting means connected to said light source means and terminating at each of said cells for conducting light into each cell;

light processing means; and

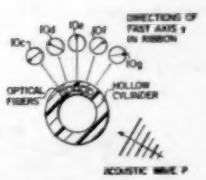


second light conducting means spaced apart from said first light conducting means and connected to said light processing means and terminating at each of said cells for conducting light from each cell to said light processing means.

4,405,198
EXTENDED FIBER OPTIC SENSOR USING BIREFRINGENT FIBERS

Henry F. Taylor, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1981, Ser. No. 295,989
Int. Cl.³ G02B 5/172; G02F 1/00
U.S. Cl. 350—96.29 11 Claims



1. In a sensor for sensing waterborne acoustic pressure waves of selected frequency, a sensor region comprising:

an elongate pressure compliant tubular member adapted to be disposed in water for receiving incident acoustic pressure waves; and,

plural parallel birefringent optical fibers fixedly secured longitudinally to the wall of the tubular member with their orthogonally disposed fast and slow axes twisted at different helical pitches of length L along their longitudinal extends which define plural response periods, respectively, of L/2 distance apart where their fast axes are disposed normal to the tubular member outer surface;

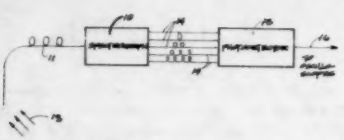
said wall adapted to apply squeeze pressure along the fibers in a direction generally only parallel to the tubular member outer surface in response to an incident acoustic pressure wave on the tubular member;

whereby acoustic sound waves whose wavelength maxima apply squeeze pressure along all the optical fibers, but, only when the maxima arrive in substantial unison at a plurality of response periods of a particular fiber, do they additively change the birefringence of that particular fiber to cause maximum relative phase shift in polarized light components passing through the fiber to identify an acoustic pressure wave of a particular frequency.

4,405,199
METHOD FOR ENHANCING SIGNALS TRANSMITTED OVER OPTICAL FIBERS

James W. Ogle, Goleta, Calif., and Peter B. Lyons, Whiterock, N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Feb. 11, 1981, Ser. No. 233,532
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.19 2 Claims

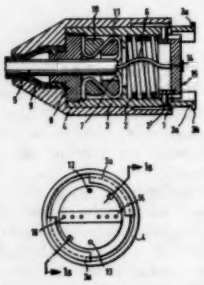


1. A method of enhancing a short, spectrally broadband signal transmitted through an optical fiber having substantial length, said method comprising the following steps:
inserting the signal into a spectrograph;
collecting a plurality of spectral components of the signal by directing the output of the spectrograph into an array of equalizing fibers whose individual fibers have relative lengths selected to compensate for prior material dispersion of the respective spectral components of the signal during transmission;
and illuminating a photodetector by the resulting output signals from the array of fibers.

4,405,200
RELEASABLE COUPLING FOR CONNECTING AT LEAST TWO LIGHT WAVEGUIDES

Hartmut Hoffmann, Leimen, and Klaus U. Baron, Heidelberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,239
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1980, 3002473
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 16 Claims

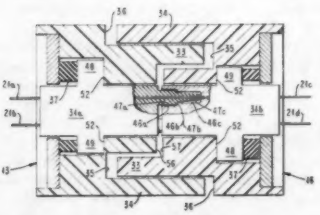


1. In a coupler for detachably placing the ends of at least two light waveguides in energy transmitting communication, which coupler is composed of two coupling halves each including a core member provided with at least two precisely positioned bores holding the ends of at least two optical fibers of an associated waveguide, a sleeve in which the core member is mounted and which is provided with at least one extension part extending axially of the sleeve, the core member having a frontal end face provided with an axially extending guide pin and a guide opening diametrically opposite the guide pin, with respect to the axis of the core member, and a sleeve nut for securing the two halves of the coupler together, the improvement wherein each said coupling half further comprises: means supporting said core member to permit said core member to be axially movable in a resilient manner in said sleeve from an end position and to have a limited axial and radial mobility therein, said core member being in its end position when said coupling halves are uncoupled and moving axially from that end position during coupling together of said coupling halves; and means associated with said sleeve for threadedly engaging said sleeve nut of the other said coupling half in order to maintain said coupling halves coupled together; and wherein said frontal end face of each said core member includes a raised portion containing the ends of the associated optical fibers, the ends of the associated optical fibers are arranged in said raised portion of each said core member along a straight line perpendicular to and bisecting the line between said guide pin and guide opening provided at said core member end face, said guide pin and said guide opening provided at said end face of each said core member are located outside of said raised portion thereof, and said guide pin provided at each said core member end face has a conical portion in the vicinity of its tip and has the form of a dowel pin in the vicinity of its base.

4,405,201
FIBER OPTIC CONNECTOR

Frank P. Cefarelli, and Robert T. Evans, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 13, 1981, Ser. No. 263,237
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 12 Claims



1. In a fiber optic connector for optically coupling a plurality of pairs of single fibers in end-to-end relationships, the combination comprising:
first and second identical sub-assemblies releasably connected to each other and being movable between connected and disconnected positions;
releasable means for holding said sub-assemblies in said connected position;
first and second identical housings interfitted with each other and forming respective parts of said first and second sub-assemblies, said housings having first aligning means allowing movement of said sub-assemblies into said connected position only when said housings are in a predetermined orientation relative to each other;
first and second sets of identical holders respectively loosely mounted in said first and second housings in an abutting side-by-side relationship, said holders in each set being movable relative to each other, each holder having a plug and a receptacle, each holder being connected to two fibers with one fiber extending through such holder and terminating at the end of said plug and with the other fiber extending through said holder parallel to said one fiber and terminating at the end of said receptacle, and first and second sets of holders being interfitted with each other with said plugs of said first set mated with receptacles of said second set and said plugs of said second set mated with receptacles of said first set, said holders having second aligning means whereby the ends of said fibers in said first set are optically aligned with and coupled to the ends of said fibers in said second set, for the efficient transmission of light energy between aligned fibers;

said first aligning means being operative when said housings are in said predetermined orientation, to further coarsely align the ends of each pair of fibers;

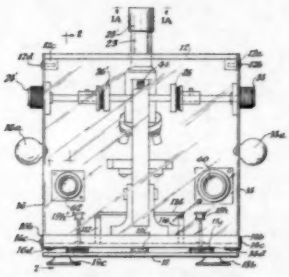
and first and second biasing means in said first and second sub-assemblies biasing said first and second sets of holders in a first direction toward engagement with first portions of said first and second housings while allowing movement of said holders in a direction opposite to said first direction and laterally thereof during movement of said sub-assemblies into said connected position, said second aligning means being operative during such movement of said sub-assemblies to laterally shift individual ones of said holders so as to exactly axially align all pairs of said fibers.

4,405,202

PROTECTIVE MICROSCOPE CONTAINER WITH REMOTE CONTROL MECHANISM

Leonard L. Kimball, 1564 NE. 191 St., Miami, Fla. 33179

Filed Mar. 30, 1981, Ser. No. 248,695
Int. Cl.³ G02B 21/00, 21/34
U.S. Cl. 350—589 **9 Claims**



1. A protective microscope container for housing a microscope having an eyepiece, a slide viewing support and a focus control, comprising:

a transparent top wall having an aperture for receiving said eyepiece and ventilating the inside of said container;

a front wall and rear wall;

a base for supporting said microscope;

a first side wall and a second side wall;

said top wall, front wall, rear wall, base, first side wall and second side wall, operably connected together whereby limited access to the inside of said container can be obtained without dismantling a wall or said base

focus control extension means for focusing said microscope externally of said container, operably connected to said container;

first connecting means for removably connecting said focus control extension means to said focus control;

moveable slide holder for receiving at least one specimen slide;

second connecting means for connecting said specimen slide to said slide holder;

two-dimensional drive means for controlling both the longitudinal and transverse position of said slide holder relative to said eyepiece;

said slide holder operably connected to said two-dimensional drive means for viewing of specimen slides;

light source for viewing said specimen slides, operably connected to said container below said slide viewing support;

lens means for changing the color or intensity of light from said light source, positionable between said light source and said specimen slides;

lens support means for supporting said lens means, operably connected to said container;

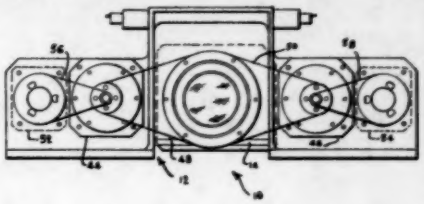
third connecting means for removably connecting said lens means to said lens support means.

4,405,203

ATMOSPHERIC DISPERSION CORRECTOR

Edward P. Wallner, Wayland, and William B. Wetherell, Stoneham, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 8, 1980, Ser. No. 195,147
Int. Cl.³ G02B 27/00, 23/00
U.S. Cl. 350—168 **9 Claims**



1. An atmospheric dispersion corrector capable of providing optimum correction over a preselected spectral band, said corrector comprising: a housing; a first simple prism; a second simple prism; said first prism and said second prism having identical prism angles w, wherein $w=m \tan \zeta_{max}$. $N_{Amax}'N_P'/2N_P^2$ and m=the magnification at said corrector, ζ_{max}=the maximum zenith angle of a ray impinging on said corrector, the overbar (⁻) represents a normalized intensity weighted spectral average, $N_{Amax}'(\lambda)=N_{Amax}(\lambda)-N_{Amax}$, $N_P'(\lambda)=N_P(\lambda)-N_P$, $N_{Amax}(\lambda)$=the refractivity of air at maximum pressure and minimum atmospheric temperature at which said corrector is to be used, $N_P(\lambda)$=the refractivity of prism material at λ, and λ=the wavelength of said ray; first means rotatably mounted within said housing for fixedly supporting said first prism therein; second means rotatably mounted within said housing for fixedly supporting said second prism therein adjacent to and in optical alignment with said first prism; and means operably connected to said first and said second rotatable prism supporting means for rotating said first and said second rotatable prism supporting means simultaneously with respect to each other as well as independently with respect to each other through an angle $2\phi_{OPT}$ in which $\phi_{OPT}=\cos^{-1}(\theta_{OPT}/2w)$ and wherein said optimum total prism angle θ_{OPT} is defined by the expression $\theta_{OPT}=m \tan \zeta N_A'N_P'/N_P^2$ wherein ζ=the current zenith angle of a ray impinging on said corrector, $N_A'(\lambda)=N_A(\lambda)-N_A$, and $N_A(\lambda)$=the refractivity of air at λ; whereby said corrector substantially eliminates the effects of atmospheric dispersion when said angle $2\phi_{OPT}$ is achieved.

4,405,204

POSITIONING CONTROL DEVICE

Michel Saint-Sevin, Gagny; Michel Blot, Arpajon, and Jacques Moirez, Paris, all of France, assignors to Societe d'Optique, Precision Electronique & Mecanique, Levallois-Perret, France

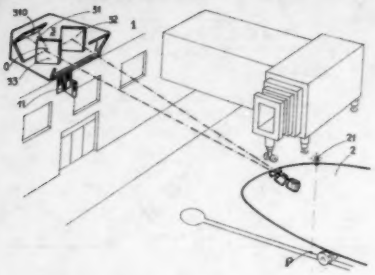
Filed Mar. 11, 1981, Ser. No. 242,762
Claims priority, application France, Mar. 19, 1980, 80 06127
Int. Cl.³ G02B 27/14; G01B 3/00
U.S. Cl. 350—174 **6 Claims**

1. Apparatus for controlling the positioning of an aircraft in a parking area at a predetermined parking location (P), comprising

(a) means for materializing a line of approach (PO) located in a vertical plane passing through said parking location (P) through a fixed reference point (O) located at a distance from said parking location;

(b) a semi-transparent mirror (33) the center of which is located at said reference point (O) and which forms a 45° angle with said line of approach (PO);

(c) a reflecting device (3) adapted to redirect, parallel to themselves, light beams which have passed through said semi-transparent mirror (33), so as to form in the eye of an observer in said aircraft a first image of a reference point (21) located on said aircraft;



(d) a plane mirror (32) adapted to form in the eye of said observer a second image of said reference point (21) on said aircraft, after three reflections, on said plane mirror (32), said semi-transparent mirror (33) and said reflecting device (3);

(e) said plane mirror (32) forming with said semi-transparent mirror (33) an angle (A) such that said first and second images are superimposed when said reference point (21) on said aircraft is located on the vertical axis of said predetermined parking location (P).

4,405,205

ADJUSTABLE MECHANISM FOR A PHOTO OBJECTIVE

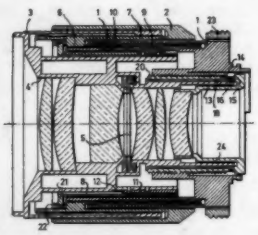
Dieter Rossmann, Aalen, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,269

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2946943

Int. Cl.³ G02B 7/04

U.S. Cl. 350—255 **9 Claims**



1. An adjustment device for photogrpahic lenses comprising:

a stationary lens housing;

a focusing ring being threadably engaged with said lens housing by threads of a first pitch;

a first lens holder for a first lens group, said first lens holder being threadably engaged with said focusing ring by threads of equal but opposite pitch to said first pitch;

a second lens holder for a second lens group, said second lens holder having a cylindrical portion with a first set of internally threaded helical grooves of a second pitch, said second lens holder being threadably attached to said housing; and

an intermediate ring having a second set of internally threaded helical grooves of said second pitch, said first lens holder being engaged in said second set of helical grooves, said intermediate ring being engaged in said first set of helical grooves in said second lens holder such that axial and rotational movement of said intermediate ring rotates said second lens holder to cause axial displacement of said second lens holder relative to said housing.

4,405,206

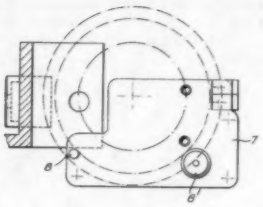
FILTER DEVICE FOR THE FILTRATION OF RADIATION

Pertti Ekholm, Helsinki, Finland, assignor to Labsystems Oy, Finland

Filed Jun. 22, 1981, Ser. No. 275,745

Int. Cl.³ G02B 5/20, 7/00

U.S. Cl. 350—318 **2 Claims**



1. A filter device for the filtration of radiation in a device for measuring radiation, said filter device comprising a plurality of individual filters fitted into a detachable filter disk wherein the filter device comprises a first magnetic elemet which is positioned at a horizontal plane located between the center axis of the filter disk, and the bottom edge of said disk, said filter disk being provided with a second magnetic element positioned at its center axis, such that the opposite poles of said first and second magnetic elements are arranged proximate to and facing each other.

4,405,207

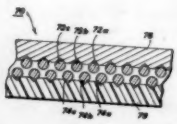
METHOD OF ASSEMBLING A GRADIENT INDEX LENS ARRAY HAVING REDUCTION PROPERTIES

David B. Kay, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,348

Int. Cl.³ G02B 5/16

U.S. Cl. 350—320 **1 Claim**



1. A method of assembling a plurality of gradient index optical fibers into a lens array comprising a first and second row of fibers capable of transmitting an image of an object at an object plane onto an image plane at a magnification other than unity comprising the steps of:

determining the relative orientation and length of said first

and second row of fibers with respect to each other and with respect to the object and image planes, said orientation resulting in a fan-fold configuration of said fibers,

forming a plurality of grooves in a first generally rectangular binding member, each groove adapted to seat an individual fiber of said first row in their previously determined relative orientations, each groove having a length which increases from the centermost groove out to both ends of the member,

forming a plurality of grooves in a second generally rectangular binding member, each groove adapted to seat an individual fiber of said second row in their previously determined relative orientations, each groove having a length which increases from the centermost groove out to both ends of the member,

progressively deepening the depth of the grooves on said first and second member in a direction extending from a first of said entrance and exit face of the completed lens to the other face wherein, when said fibers are seated in their respective grooves, said first and second rows are tilted so as to adjoin each other at one face of the array while separated from each other at the other array face

placing gradient index optical fibers of approximately equal length into the grooves of said first and second members, the fiber length being such that the fibers extend beyond the ends of the grooves,

adhesively seating the optical fibers into the grooves,

bonding said first member to said second member to form a lens array, and

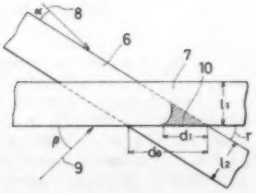
abrading and polishing the entrance and exit faces of said array so as to reduce the fiber lengths to said predetermined values and to achieve relatively smooth convex entrance and exit faces.

4,405,208

LIQUID CRYSTAL DISPLAY DEVICES WITH POLYIMIDE-SILOXANE COPOLYMER RESIN ALIGNMENT FILM

Yoshihiro Shirai, Tsurumaihigashimachi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1981, Ser. No. 230,541
Claims priority, application Japan, Feb. 8, 1980, 55-14937
Int. Cl.³ G02F 1/13
U.S. Cl. 350—341 **14 Claims**



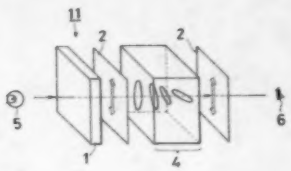
1. A liquid crystal display device comprising a pair of opposed substrates, a transparent electrode provided on at least one of the substrates, a liquid crystal composition sandwiched between the substrates and an orienting film of a polyimide-siloxane copolymer resin formed at least over the surface of the electrode which is on the substrate, said orienting film being in contact with the liquid crystal composition.

4,405,209

MATRIX LIQUID-CRYSTAL DISPLAY DEVICES

Fumiaki Funada; Toshiaki Takamatsu; Ishii Yutaka, and Tomio Wada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 10, 1981, Ser. No. 233,091
Claims priority, application Japan, Feb. 29, 1980, 55-25913
Int. Cl.³ G02F 1/13; C09K 3/34
U.S. Cl. 350—341 **8 Claims**



1. A matrix liquid-crystal display device for video image using DTN mode comprising a pair of transparent substrates defining a pair of mutually facing surfaces, transparent electrodes provided on each of said surfaces, an insulating layer with orienting property formed on said electrodes on each of said surfaces, a liquid-crystal layer formed by depolarization in a twisted-nematic layer, said liquid crystal being nematic with a negative dielectric anisotropy, and sandwiched between said mutually facing insulating layers, and a polarizer provided on the opposite surface of each of said substrates from said liquid-crystal layer, and the liquid-crystal layer contains an ionic dopant such that the cut-off frequency Fc(Hz) of said liquid-crystal layer satisfies the following relationship within a range of ambient temperatures:

$$16\frac{C}{C_0}\cdot N\cdot F \gtrsim f_c \gtrsim 8\cdot N\cdot F$$

in which N stands for the number of multiplex driving, F stands for the frame frequency of an image signal, C stands for the capacitance per unit area of said insulating layers, and C_0 stands for the capacitance per unit area of said insulating layers when they have a specific dielectric constant ϵ of about 4 and a thickness of about 100 A, where the f_c value of the device is at least about 29 kHz, and such that the reproduction of a video image with a half-tone is achieved.

4,405,210

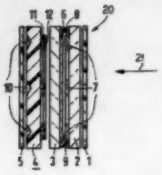
DISPLAY DEVICE FOR DISPLAYING LIGHT IMAGES ON A DARK BACKGROUND

Guenter Baur, Freiburg; Waldemar Greubel; Hans Krueger, both of Munich, and Alois Schauer, Gruenwald, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 877,461, Feb. 13, 1978, abandoned.
This application May 19, 1980, Ser. No. 151,173
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706405
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ G02F 1/13
U.S. Cl. 350—345 **4 Claims**

3. In a display device for displaying bright images on a dark background, said device including a liquid crystal cell having a liquid crystal layer which is electrically switchable by zones between an operative state and in inoperative state, said layer being enclosed by two carrier plates with a predetermined wall orientation; means for individually switching zones of the layer between the operative and inoperative states; and a light trap in the form of a body containing fluorescent particles, said body being made of material with a refractive index of more than 1

and being provided with a light emergent window disposed behind each of the switchable zones of the liquid crystal layer in the direction of observation, the improvements comprising the cell including a linear polarizer disposed adjacent one of said carrier plates, the liquid crystal layer having a dielectric constant with a negative anisotropy, said layer, while in an inoperative state, being oriented in a tilted homeotropic manner with a tilt twisted through 90° towards the plate normal and parallel with the direction of polarization of the linear



polarizer at the carrier plate near the polarizer, said layer, while in an operative state, assuming a twisted homogeneous orientation with a bias predetermined by the direction of tilt, and said liquid crystal layer containing at least one pleochroic dye, said dye being selected to absorb the excitation light for the fluorescent particles at a low level in each zone that is in the inoperative state and to absorb the fluorescent light at a high level in each zone in the operative state so that the zones are only placed in an operative state when the zone belongs to the background of the image.

4,405,211

LIQUID CRYSTAL COMPOSITIONS WITH PLEOCHROIC ANTHRAQUINONE DYES

Kenneth J. Harrison, Malvern Link; Edward P. Raynes, Malvern; Frances C. Saunders, Malvern Wells, and David J. Thompson, Whitefield, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

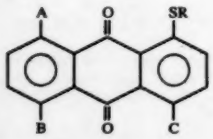
Filed Jul. 27, 1981, Ser. No. 287,118

Claims priority, application United Kingdom, Jul. 29, 1980, 8024797

Int. Cl.³ G02F *1/13*; C09K *3/34*

U.S. Cl. 350—349 **44 Claims**

1. A material suitable for a guest-host liquid crystal device comprising a solution of a liquid crystal material and a pleochroic dye, wherein the pleochroic dye comprises at least one compound having a formula:



Formula (I)

wherein:

R represents a group selected from alkyl and aryl;

each of A, B and C independently represents a group selected from H, —SR and —NR_2R_2 groups, wherein R_1 and R_2 are independently selected from H, alkyl and aryl;

provided that at least one of A, B and C is other than H and that if two of A, B and C are H, then the third is NR_1R_2.

4,405,212

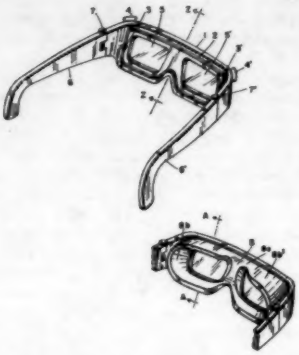
SPECTACLE FRAME AND CONVERSION ACCESSORIES THEREFOR

Leonard B. Cooper, Capri G300, Delray Beach, Fla. 33446

Continuation-in-part of Ser. No. 107,322, Dec. 26, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 213,949

Int. Cl.³ G02C *5/00*

U.S. Cl. 351—43 **6 Claims**



1. A spectacle frame of the every-day type convertible into a water-tight goggle, said frame having (1) manually detachable temples, (2) means for receiving a prescription ground lens in each eyepiece, and (3) in its inner face a circumferential channel adapted to hold with a tight fit a correspondingly ridged frame-to-face seal.

4,405,213

MAKEUP EYEGLASSES WITH SLIDING FRAMES

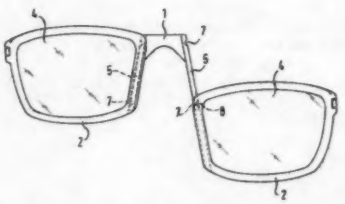
Ingeborg Kolkmann, A 6323, Bad Haring, Austria

Filed Oct. 16, 1980, Ser. No. 197,434

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 7930575[U]

Int. Cl.³ G02C *5/00*

U.S. Cl. 351—59 **4 Claims**



1. Makeup glasses, comprising: a separate pair of frames (2) each adapted to mount an individual eyeglass lens, a pair of temple arms (3) individually hinged to the lens frames, a nose bridge (1), a pair of track-like shanks (5) on opposite sides of the nose bridge and extending downwardly therefrom, a pair of grooves (6) individually defined in central, proximate, substantially vertical sides of the frames and extending throughout the heights thereof, said grooves being configured to matingly engage and slidably receive said nose bridge shanks so that either the left or the right frame along with a lens (4) mounted therein can be pushed perpendicularly away and downwardly from the transverse axis of the nose bridge, and lock stops for the pushed-up and pushed-down positions of the frames provided between the shanks and the grooves, said makeup glasses having the appearance of an ordinary and conventional pair of

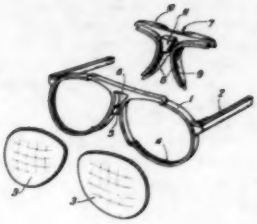
eyeglasses without extraneous appendages or attachments when both frames are in their pushed-up positions.

4,405,214

SAFETY GLASSES

Maurice Bolle, Oyonnax, France, assignor to Etablissements Bolle Georges, Robert et Maurice, Oyonnax, France

Filed Jan. 30, 1981, Ser. No. 229,944
Claims priority, application France, Feb. 4, 1980, 80 02353
Int. Cl.³ G03B 21/32
U.S. Cl. 351—88 6 Claims



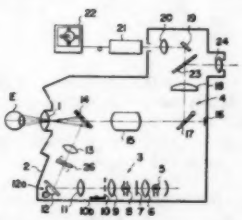
1. In a pair of safety glasses comprising a frame, to which two limbs are articulated, two lenses mounted on the inside of grooved retaining circles formed in the said frame, and a nose rest piece which fits together with the frame and is made of flexible material, the improvement wherein each of said circles is unitarily formed with lens-receiving grooves terminating in the region of said nose rest piece and with a nongrooved portion in said region, said nose rest piece having grooved walls overlying said nongrooved portions and which form part of the said grooved retaining circles by completing the lens-receiving grooves in said regions.

4,405,215

WORKING POSITION LOCATING MEANS FOR OPHTHALMOLOGIC APPARATUS

Eiichi Sano, and Kazuo Nunokawa, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,001
Claims priority, application Japan, Nov. 14, 1980, 55-160161
Int. Cl.³ G03B 29/00; A61B 3/14
U.S. Cl. 351—208 6 Claims



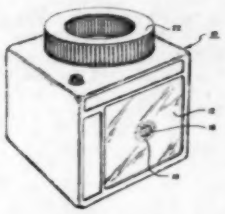
1. An ophthalmologic apparatus including objective lens means adapted to be placed opposite to an eye to be examined, a ring-shaped slit projection system having an optical axis of projection and comprising ring slit aperture means substantially conjugate with an anterior portion of the eye with respect to the objective lens means and light source means for projecting an illuminating luminous flux through said slit aperture means and said objective lens means upon said eye to produce an image of said ring slit aperture means, an observation optical system for observing light which has passed from said eye through said objective lens means, said observation optical system having a focal plane, a working position locating means including means disposed in said ring-shaped slit projection system for deviating the image of said ring slit aperture means to a predetermined extent with respect to the optical axis of projection so that a proper working position with respect to said eye will be indicated by the position of the ring slit image upon the focal plane of said observation optical system.

4,405,216

GLARE SUSCEPTIBILITY TESTER

M. Princeton Nadler, Sewickley, Pa., and David Miller, Boston, Mass., assignors to Mosebach Electric & Supply Company, Pittsburgh, Pa.

Filed May 20, 1981, Ser. No. 265,403
Int. Cl.³ A61B 3/02, 3/00
U.S. Cl. 351—237 4 Claims



1. A glare susceptibility testing device comprising:

a a plurality of planar members each member having:

(i) a target image approximately centrally located on its surface;

(ii) a contrasting surface adjacently surrounding the target image and which provides a contrast with the target when light is directed to the target and the contrasting surface, each contrasting surface of each member varies from the contrasting surface of the other members; and

(iii) a translucent surface adjacently surrounding the contrasting surface; and

b. means supporting the planar member and directing light through the planar member to produce an image of the target and contrasting surface which is totally surrounded by a glare source produced by the light.

4,405,217

FILM SPEED CONTROL SYSTEMS FOR HIGH SPEED MOTION PICTURE CAMERAS

Gordon W. Brant, Sunnyvale, Calif., assignor to Redlake Corporation, Campbell, Calif.

Filed Sep. 1, 1981, Ser. No. 298,388
Int. Cl.³ G03B 1/00, 41/00
U.S. Cl. 352—84 14 Claims

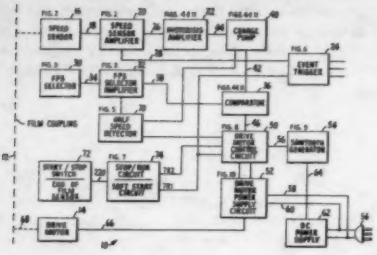
1. A film speed control system for high speed motion picture cameras, comprising:

actual film speed signal source means for producing an actual film speed signal representing the speed of the film in a high speed motion picture camera;

selected film speed signal source means for producing a selected film speed signal representing a selected speed of operation of said high speed motion picture camera;

charge pump means responsive to said actual film speed signal to produce an output signal the magnitude of which is substantially linearly related to said actual film speed

signal over a range extending at least from ten thousand pulses per second to forty thousand pulses per second; and



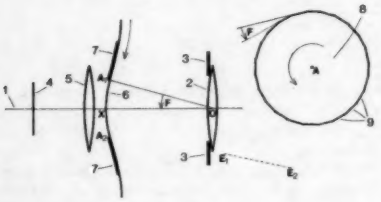
comparing means for comparing said selected film speed signal and said output signal.

4,405,218

SHUTTERLESS OPTICAL SYSTEM FOR VIEWING MOTION PICTURES

John L. Wirth, 408 Greenwood Pl., Syracuse, N.Y. 13210

Filed Jul. 30, 1981, Ser. No. 288,464
Int. Cl.³ G03B *41/06*
U.S. Cl. 352—108 **2 Claims**



1. The optical system for viewing motion picture film consisting of

a. the optical-mechanical mechanism consisting of

(1) a first convergent lens

(2) processed motion picture film in the standard format advancing in continuous motion at constant velocity such that points on the vertical midline of the frames of said motion picture film follow a path with the property that over an interval of said path in the vicinity of the optical axis of said first lens said points advance in a circle whose center is the optical center of said first lens; in which the length of said interval is equal to the frame height of said motion picture film; and in which, for the length of said motion picture film having said points within said interval, the curved plane of said motion picture film substantially coincides with the focal plane of said first lens

b. a mirror wheel on the side of said first lens opposite to said motion picture film, in which

(1) if 2F is the angle in degrees subtended by said interval at the optical center of said first lens, said mirror wheel has 360/F mirrored surfaces

(2) said mirror wheel rotates on an axis perpendicular to the plane through said midline points of said motion picture film such that

(A) if in a sectional view at said plane points of said motion picture film advance counterclockwise around the optical center of said first lens, said mirror wheel rotates counterclockwise, and if points advance clockwise said mirror wheel rotates clockwise

(B) if points of said motion picture film advance with angular velocity V around the optical center of said first lens, said mirror wheel rotates with angular velocity ½V

c. a stop at the curved plane of said motion picture film with an aperture such that said midline points of said motion picture film within said interval lie within said aperture and those not within said interval do not lie within said aperture, such that in the course of the advance of said film every point within every frame of said film lies within said aperture for the same interval of time, and such that no two points of said film separated by a horizontal distance greater than the width of the frames of said film simultaneously lie within said aperture

d. a film illumination system consisting of

(1) a second convergent lens, on the side of said motion picture film opposite to said first lens, whose optical axis is parallel to the plane through said midline points of said motion picture film

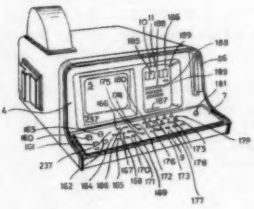
(2) a line light source parallel to the plane through said midline points of said motion picture film, intersecting the optical axis of said second lens, and in the focal plane of said second lens.

4,405,219

OPTICAL IMAGE SYNTHESIS METHOD AND APPARATUS

Mitsuo Yasuda, Tenri; Katsuji Minami, Osaka; Jiro Itokawa, Takaishi; Yoshiyuki Aoto, Nara; Yasuyuki Hatakeyama, Nishinomiya, and Shinya Sakaida, Yao, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1981, Ser. No. 240,468
Claims priority, application Japan, Mar. 17, 1980, 55-34542; Dec. 8, 1980, 55-176000
Int. Cl.³ G03B *21/26*
U.S. Cl. 353—37 **27 Claims**



1. A coiffure image synthesis and display system comprising:

first image display means for displaying a first image of a user of said system;

second image display means for selectively displaying one of a plurality of second images representative of prepared coiffures;

screen means for displaying images thereon;

partial reflecting means for redirecting a portion of said first image onto said screen means, a portion of said second image being passed by said partial reflecting means and displayed on said screen means;

the portions of said first and second images being displayed on said screen means in combination producing a superimposed image of the user modeling a selected coiffure image; and

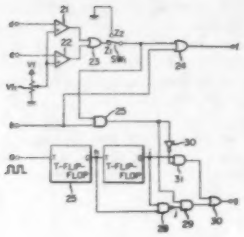
selective movement means for selectively removing said partial reflecting means from an operative position, said selected coiffure image thereby being displayed by said screen means in its entirety while said first image of the user is not displayed on said screen means.

4,405,220

AUTOMATIC FOCUSING APPARATUS FOR A CAMERA

Yosuke Kusaka, Kawasaki, and Nobuo Okabe, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,440
Claims priority, application Japan, Nov. 7, 1980, 55-156574
Int. Cl.³ G03B 3/10
U.S. Cl. 354—25 4 Claims



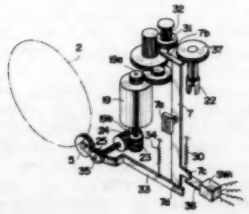
1. An automatic focusing apparatus for a camera, including:
(1) object brightness detecting means for detecting the brightness of an object and producing an output corresponding to the brightness;
(2) in-focus detecting means for detecting whether the phototaking lens of the camera lies within or outside a predetermined in-focus range near the in-focus position and producing outputs corresponding to the respective cases; and
(3) phototaking lens driving means for driving said phototaking lens to its in-focus position in accordance with the output of said object brightness detecting means and the output of said in-focus detecting means, said phototaking lens driving means driving said phototaking lens at high speed when the object is of high brightness and the phototaking lens lies outside the predetermined in-focus range and at low speed when the object is of low brightness and the phototaking lens lies within the predetermined in-focus range.

4,405,221

CAMERA MOTOR DRIVE MECHANISMS

Fumio Yoshida, Osaka; Yukio Miki, Sakai, and Takeshi Egawa, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1981, Ser. No. 311,188
Claims priority, application Japan, Nov. 6, 1980, 55-155196
Int. Cl.³ G03B 1/18
U.S. Cl. 354—173 5 Claims



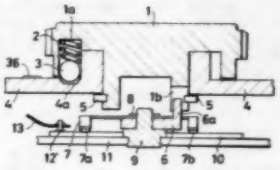
1. A motor drive camera, comprising:
a first motor;
a film winding mechanism connected to said first motor, said film winding mechanism being capable of winding a film when said first motor is actuated;
a second motor;
a control device for automatically performing a preparatory operation prior to the commencement of an exposure;
film rewinding mechanism for rewinding an exposed film; and
means for connecting said second motor alternatively to said control device and to said film rewinding mechanism.

4,405,222

MODE SETTING DEVICE FOR CAMERA

Hiroshi Yamamoto; Masanori Uchidoi, both of Yokohama, and Masaharu Kawamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 73,799, Sep. 10, 1979, Pat. No. 4,307,953. This application Jan. 12, 1981, Ser. No. 273,030
Claims priority, application Japan, Sep. 14, 1978, 53-113052
Int. Cl.³ G03B 9/64
U.S. Cl. 354—238 5 Claims

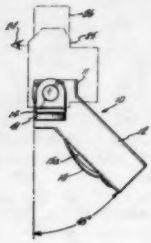


1. A camera comprising:
(a) a camera body;
(b) a mode setting dial rotatably mounted on said camera body and having a plurality of symbols, each one of said symbols representing an exposure mode, said symbols including a first symbol corresponding to automatic exposure controlled photography and a second symbol corresponding to automatic exposure controlled photography after a certain time delay;
(c) a fixed index on the camera body for selectively registering with said first and said second symbols;
(d) a shutter release member;
(e) a control circuit including a light measuring circuit, an automatic exposure control circuit for controlling an exposure on the basis of an output of said light measuring circuit, an electromagnetic release circuit for starting an exposure operation and for placing said automatic exposure control circuit in an operative state after said electromagnetic release circuit becomes operative, and a self-timer circuit connected to said electromagnetic release circuit wherein said electromagnetic release circuit becomes operative in response to an output from said self-timer circuit;
(f) a first switch coupled to said shutter release member for actuating said electromagnetic release circuit; and
(g) a second switch coupled to said mode setting dial, said second switch arranged to be in a first state when said first symbol is registered with said index and arranged to be in a second state when said second symbol is registered with said index, wherein said second switch is coupled to said self-timer circuit for holding said self-timer circuit in an inoperative state when said second switch is in said first state, and for enabling said self-timer circuit to be actuated by operation of said first switch when said second switch is in said second state, said second switch preventing a response by said release circuit to said first switch when said second switch is in said second state.

4,405,223
PISTOL GRIP

Steven W. Shull, Culver City, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Feb. 18, 1982, Ser. No. 349,922
Int. Cl.³ G03B 17/56
U.S. Cl. 354—293 8 Claims



1. A pistol grip for photographic cameras, electronic flash units, and the like comprising

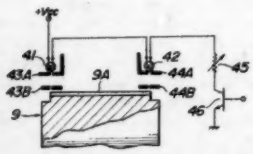
a body having a handle extending therefrom, said body having an imagery vertical axis, and said handle being disposed at an angle with respect to the body, said body further including sides for receiving mounting means for a camera bracket, and

mounting means for a camera bracket comprising bracket connector means for mating with one side of said body and fastener means for mounting with the other side of said body for securing together said fastening means and bracket connector means with the bracket connector means readily disposed on either side of said body.

4,405,224
ELECTROPHOTOGRAPHIC APPARATUS HAVING MEANS FOR REMOVING UNDESIRED CHARGE CONCENTRATED ON AN EDGE PORTION OF A PHOTOSENSITIVE MEMBER

Muneo Kasuga; Masaji Nishikawa, and Tomoki Funakubo, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 17, 1980, Ser. No. 210,386
Claims priority, application Japan, Nov. 22, 1979, 54-150684
Int. Cl.³ G03G 21/00
U.S. Cl. 355—3 R 4 Claims

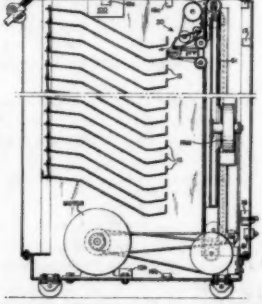


1. In an electrophotographic apparatus comprising, a moving photosensitive member whose width is narrower than that of a recording sheet of paper, a corona discharge device for uniformly charging said photosensitive member, an image-projecting member for projecting an original image on said photosensitive member so as to produce an electrostatic latent image thereon, a developing device for developing said latent image, and a transferring device for transferring the developed image onto the recording paper, whereby said corona discharge device, image projecting member, developing device and transferring device are arranged along the periphery of the photosensitive member in this order viewed in a moving direction of the photosensitive member and the electrostatic latent image once formed on the photosensitive member is repeatedly subjected to development and transferring for copying one original onto a plurality of sheets of the recording paper, the improvement comprising an electric charge removing device arranged between said transferring device and said developing device viewed in the moving direction of the photosensitive member and for removing undesired electric charge from an edge portion of said photosensitive member after said transferring but before the next succeeding development of said latent image in the course of regarding developments and transferrings of one electrostatic latent image once formed on said photosensitive member, said undesired electric charge being injected onto the edge portion of said latent image on the photosensitive member via the recording paper by the transferring device, wherein said electric charge removing device comprising a lamp and a pair of spaced slits, one slit being disposed close to the lamp and the other slit being disposed closed to the photosensitive member to produce a sharply directed light beam to the edge portion of the photosensitive member.

4,405,225
COLLATOR

Eric P. Perrault, Seattle, Wash., assignor to Donald L. Snellman, Seattle, Wash.

Filed Dec. 23, 1980, Ser. No. 219,527
Int. Cl.³ G03G 15/00, 21/00
U.S. Cl. 355—14 R 8 Claims



1. A sophisticated collator capable of intercommunicating with a computer of a computer-controlled photocopier to receive job commands from the photocopier regarding the mode and size of a collating job to be transmitted to the collator directly from the photocopier, to store the job commands in a buffer, and to control the collating operations of the collator based upon the job commands while reporting progress of the collating operations to the photocopier during the operation, comprising:

(a) a sheet conveyor system for receiving sheets from the photocopier and for transporting the sheets to trays in a bin unit during the collating operation, the system including a movable deflector means for deflecting the sheets from a conveyor into predetermined trays;

(b) a logic control means, having a programmable computer with a stored program, for communicating with the computer of the photocopier and for controlling the collating operations in the collator upon receipt of the job commands from the photocopier, including a buffer for storing the job commands to remove dependency upon the photocopier for continued checking of the desired collating operation, the logic control means being connected to means for sensing collating operation information within

the collator to monitor the collating operation and being connected to the conveyor system to control operation of the conveyor system;

(c) means for sensing the entry of a sheet into the collator from the photocopier and for signalling the entry to the logic control means so that the logic control means can count the entry of the sheet and monitor the passage of the sheet along the conveyor system to a predetermined tray selected on the basis of the job commands;

(d) means for identifying the individual trays of the bin unit by counting the operation of the deflector means at each tray so that the position of the deflector means ready to deflect sheets to a tray represents the position of the tray; and

(e) means for sensing entry of the sheet into the predetermined tray and for signalling the entry to the logic control means so that the logic control means can count the entry and command continued collating operations based upon the entry, such as changing the deflector means or signalling a jam to the photocopier.

4,405,226

DEVELOPING MATERIAL SUPPLYING CONTROL DEVICE FOR ELECTROSTATIC COPYING APPARATUS

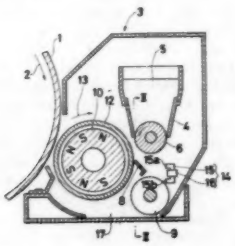
Hiroshi Kimura, Neyagawa; Masahiko Hisajima, Osaka; Yutaka Shigemura, Takarazuka; Isao Yada, Neyagawa; Yoichiro Irie, Suita, and Kiyoshi Morimoto, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

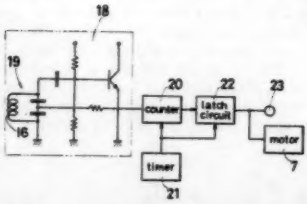
Filed Jul. 16, 1981, Ser. No. 283,942

Claims priority, application Japan, Jul. 23, 1980, 55-101770

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—14 D **2 Claims**





1. A developing material supply control device for use in an electrostatic copying apparatus, said device comprising:

an oscillation circuit, including an oscillation coil and adapted to be positioned along a toner supply passage, for generating an output signal representative of the relative amount of toner present at said passage;

a timer for providing predetermined time intervals;

a counter for counting said output signal from said oscillation circuit at every interval predetermined by said timer to supply a discriminating output signal when the counted value is equal to a predetermined value for each of the intervals; and

toner supply means operable in response to said discriminating output signal from said counter for supplying toner to said toner supply passage.

4,405,227

PHOTOGRAPHIC APPARATUS

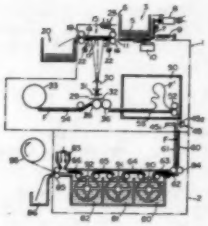
Syunzo Inoue, Yokohama; Toshio Arai, Kawasaki; Takeshi Nagasawa; Motofumi Konishi, both of Yokohama; Hitoshi Yanagawa, Tokyo; Toshio Iwaya, Machida, and Michio Kasuya, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 114,890, Jan. 24, 1980, abandoned. This application Apr. 6, 1982, Ser. No. 366,068

Claims priority, application Japan, Feb. 9, 1979, 54-14631; Feb. 9, 1979, 54-14632; Feb. 9, 1979, 54-14633; Feb. 9, 1979, 54-14634

Int. Cl.³ G03B *27/32, 27/52*

U.S. Cl. 355—27 **8 Claims**



1. A recording apparatus, comprising:

means for recording an image on a long length of film at an exposure station;

storage means for storing, in a loop, the film transported from the exposure station;

means for developing the film fed from said storage means;

means for feeding the film from said storage means to said developing means;

manual switching means (130);

means for keeping said feeding means inoperative to prevent it from feeding the film stored in said storage means to a developing portion of said developing means until said switching means is actuated, and for permitting, responsive to said switching means, the operation of the feeding means for feeding the film to the developing portion;

means for halting the operation of said recording means when the amount of the film in said storage means reaches a predetermined amount;

means, responsive to said switching means, for releasing the recording means from said halting means;

means for cutting the film; and

means for operating said cutting means to cut the film after said switching means is actuated.

4,405,228

CARD NEGATIVE HOLDER AND METHOD OF MANUFACTURE

Richard D. Muscoplat, 1435 Quebec Ave. North, Golden Valley, Minn. 55427

Filed Jun. 15, 1981, Ser. No. 273,471

Int. Cl.³ G03B *27/62*; A47G *1/06*; G09F *1/10*

U.S. Cl. 355—75 **6 Claims**

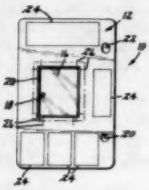
1. A mounting card for holding a photographic negative, said negative having base and emulsion sides, top and bottom edges, and opposite side edges, said mounting card comprising:

a flat member having top and bottom edges with a length therebetween and a pair of opposite side edges, said mem-

ber further having first and second sides and a window through which said negative may be exposed;

means for holding said negative to said flat member so said negative may be exposed through said window, said holding means having a top edge,

said holding means being attached to the first side of said flat member near the pair of opposite side edges, said holding



means including means for eliminating exposed edges between the top edge of said negative and the top edge of said flat member;

whereby said mounting card may include printed matter on the second side of said flat member and near the window on the first side of said flat member, said eliminating means preventing such mounting card from catching in an automatic processing machine.

4,405,229

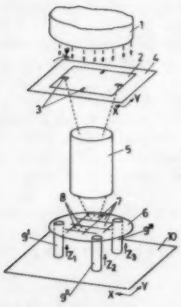
METHOD OF PROJECTING PRINTING ON SEMICONDUCTOR SUBSTRATE AND WORKPIECE INCLUDING SUCH SUBSTRATE

Herbert E. Mayer, Eschen, Austria, assignor to Censor Patent- und Versuchs-Anstalt, Vaduz, Liechtenstein

Filed May 20, 1981, Ser. No. 265,549

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **7 Claims**



1. A method of facilitating the alignment of a photomask with a workpiece onto which the pattern of the photomask is to be imaged for projection printing, said workpiece including a light-reflecting substrate overlain by a partly reflecting layer of photosensitive character, comprising the steps of:

(a) providing a reference marking on said photomask;

(b) providing an adjustment mark correlated with said reference marking on said workpiece, said adjustment mark being a reflection-reducing discontinuity in said layer;

(c) making the thickness of said layer nonuniform in an area immediately surrounding said discontinuity while maintaining the top surface of said layer substantially planar in said area; and

(d) jointly illuminating said adjustment mark and said reference marking with monochromatic light of a predetermined wavelength for simultaneously imaging same on a receiving surface, said thickness having at least two values differing by other than a multiple of half said wavelength to provide a contrasting background for said adjustment mark.

4,405,230

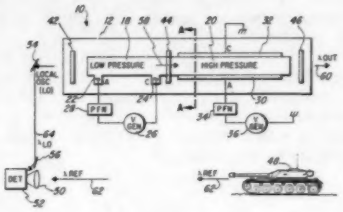
HETERODYNE LASER RANGING SYSTEM

Claude E. Tew, Dallas, and Fred E. Ellis, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1981, Ser. No. 267,940

Int. Cl.³ G01C *3/08*; H01S *3/00*

U.S. Cl. 356—5 **6 Claims**



1. A heterodyne laser ranging system comprising a waveguide housing formed of a material suitable for providing an inherently temperature stable system, said waveguide housing having first and second lasers and first, second, and third reflectors selectively mounted therein in substantially optical alignment, said first laser including electrode means including first and second electrodes for producing a low level signal for a preselected time period at a selected frequency, said first reflector operatively positioned as to the first laser to reflect a first portion of the first laser output back through the laser while passing a second portion as a low level local oscillator signal (f_{ref}), said second reflector operatively positioned between said first and second lasers and having a first reflecting surface for reflecting a first portion of the first laser energy back through the first laser while passing a second portion into the second laser as a low level stable frequency signal substantially equal to the frequency of the local oscillator signal and a second reflecting surface for reflecting the laser energy of the second laser back through the second laser, said second laser having electrode means including first and second transversely spaced electrodes operative in response to the low level stable frequency signal of the first laser for producing a high level signal at substantially the same frequency (f_{ref}), as that of the local oscillator signal, and said third reflector for reflecting a first portion of the second laser energy impinging thereon while passing a second portion as a high power output pulse at the same frequency as the low level local oscillator, whereby said first and second lasers have substantially close optical alignment tolerances and electrode spacing thereby providing substantially increased output power per cubic inch of waveguide housing, and detector means for detecting said local oscillator signal (f_{ref}) and any laser return of the high power output pulse including a doppler shifted return pulse (f_r) for mixing sid f_{ref} and f_r signals and generating desired ranging information.

4,405,231

DEFORMOGRAPH

Evgeny I. Shemyakin, ulitsa Pravdy, 1, kv. 32, and Gennady I. Kulakov, ulitsa Rossiiskaya, 15, kv. 39, both of Novosibirsk, U.S.S.R.

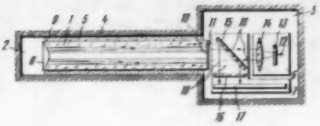
Filed Sep. 22, 1981, Ser. No. 304,387

Int. Cl.³ G01B *11/18*; G01L *1/24, 33/24*

U.S. Cl. 356—34 **5 Claims**

1. A deformograph comprising a polarized light source designed to produce a light signal; a sensitive element shaped as a tube made of an optically sensitive material and fixed in a borehole by cementing the gap between said tube and walls of

said borehole, one of ends of said sensitive element being tapered off and provided with a specular coating, while the other end facing said light source has a specular coating with transparent sections enabling passage of a light beam through the



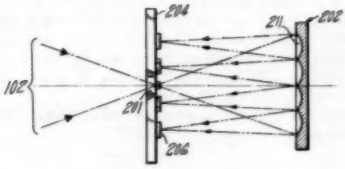
material of said sensitive element and its output after being reflected from the specular coating on the tapered end; a sensing unit designed to pick off from said sensitive element a useful light signal indicative of the changing condition of the earth's crust in a given area.

4,405,232

WAVE FRONT SENSING DEVICE

Dennis N. Mansell, Albuquerque, N. Mex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 2, 1981, Ser. No. 298,830
Int. Cl.³ G01J *1/20*
U.S. Cl. 356—121 **3 Claims**



1. An optical device comprising:

a detector plate having a plurality of optical detectors disposed on a first side thereof and an aperture of a predetermined size for permitting the passage along a beam axis of an optical beam therethrough;

a substrate having a plurality of concentric circular mirrors thereon, said substrate being disposed along said optical axis so that said mirrors are centered on said axis, each of said mirrors having a reflective surface facing said first side of said detector plate and being configured in such a manner that an annular portion of said optical beam is focussed to a ring focus at a predetermined location on said first side, said plurality of optical detectors being disposed on said first side at predetermined locations such that each of said detectors responds to a portion of one of said ring foci.

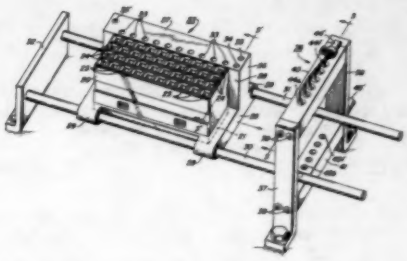
4,405,233

PHOTO-ELECTRIC APPARATUS FOR TESTING ELECTRICAL CONNECTOR CONTACTS

Thomas G. Grau, Mendham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1980, Ser. No. 156,565
Int. Cl.³ G01N *21/00*; G01R *31/04*
U.S. Cl. 356—237 **8 Claims**

8. Apparatus for testing an article of manufacture (20) having at least one channel therethrough characterized in a carriage (22) for supporting said article (20), said carriage being formed to present an unimpeded light path therethrough at said channel, a first light emitting device (45*a*) and a first light sensing device (44*a*), said devices (45*a*, 44*a*) being spaced apart to permit movement of said carriage (22) and said article (20) therebetween, said light sensing device (44*a*) generating output signals responsive to light passing uninterruptedly from said light emitting device (45*a*) through said channel when said carriage (22) is moved between said light emitting and sensing devices (45*a*, 44*a*), further characterized in that said carriage (22) has an aperture (33) therethrough aligned with said channel when said article (20) is supported by said carriage (22) and



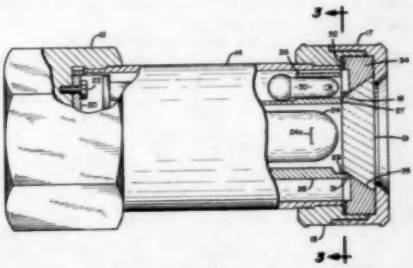
in a second light emitting device (45*e*) and a second light sensing device (44*e*) for generating an indexing signal responsive to light passing from said second light emitting device (45*e*) through said aperture (33) indicating an alignment of said channel, and further characterized in rail means (30, 31) and in that said carriage (22) is adapted for slidable movement on said rail means.

4,405,234

RADIATION DETECTION APPARATUS HAVING REFRACTIVE LIGHT CHECKING FEATURE

Michael P. Juaire, Chaska, Minn., assignor to Detector Electronics Corp., Minneapolis, Minn.

Filed Aug. 3, 1981, Ser. No. 289,813
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—239 **19 Claims**



1. A radiation detection apparatus having facility for self checking of optical surface contamination, comprising:

(a) a housing having an opening at one end thereof;

(b) a radiation-sensitive receiving device in said housing;

(c) a light transmissive window mounted in said housing opening, said window having flat parallel surfaces orthogonal to said radiation sensitive receiving device and a beveled edge surface facing toward the interior of said housing;

(d) an optical shielding member about said receiving device and having an opening facing said window, said shielding member opening further comprising a first edge portion contacting said window interior flat surface and a second edge portion terminating in the region of said beveled edge surface, said second edge portion having a reflective surface area facing said beveled edge surface;

(e) a light source mounted in said housing outside said optical shielding member, and positioned relative to said beveled edge so as to cause light from said light source to travel through said beveled edge and be refracted from said window outer parallel surface to said optical shielding member second edge portion reflective surface, and reflected therefrom to said radiation-sensitive receiving device.

4,405,235

LIQUID CELL FOR SPECTROSCOPIC ANALYSIS

Val J. Rossiter, 16 Rathmore Ave., Stillorgan, Dublin, Ireland

Filed Mar. 19, 1981, Ser. No. 245,427
Int. Cl.³ G01N 21/05
U.S. Cl. 356—246 10 Claims

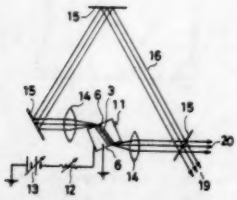
1. A liquid cell for use in spectroscopic analysis of flowing liquids formed by a front plate as an optical window, a back plate having spaced apart apertures therein, a tapered reflecting surface on the back plate between the apertures, and a sealing means between said two plates, each of said apertures being an entry and an exit port, respectively, for liquids to the cell.

4,405,236

SEMICONDUCTOR RING LASER APPARATUS

Yoshinobu Mitsuhashi; Junichi Shimada; Kenjiro Sakurai, all of Sakura, and Yukinobu Nakamura, Asaka, all of Japan, assignors to Seiichi Ishizaka and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,418
Claims priority, application Japan, Aug. 13, 1980, 55-110419
Int. Cl.³ G01C 19/64
U.S. Cl. 356—350 7 Claims



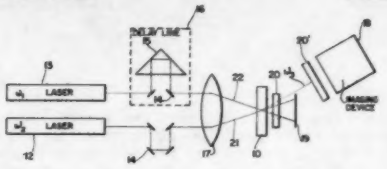
1. A semiconductor ring laser apparatus comprising a semiconductor laser element having a waveguide region therein and parallel cleavage planes formed between said waveguide region and medium adjacent thereto, wherein the waveguide region is inclined at a Brewster angle with respect to the normal to the cleavage planes in relation to the medium of the waveguide region and said adjacent medium, and optical means having a ring-formed optical path optically coupled to said waveguide region for receiving light therefrom through one of said cleavage planes and returning at least a portion of the light therefrom to the other of the cleavage planes, said semiconductor laser element and said optical means thereby forming a ring laser oscillator.

4,405,237

COHERENT ANTI-STOKES RAMAN DEVICE

Thomas J. Manuccia, Silver Spring, Md., and John F. Reintjes, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1981, Ser. No. 231,636
Int. Cl.³ G01J 3/44
U.S. Cl. 356—301 5 Claims



3. A CARS imaging device for microscopically imaging a specific molecular species in a condensed-phase medium sample:

means for generating pairs of pulses from two laser beams of different frequencies, ω_1 and ω_2, and focusing each associated pair on said sample, the pulse durations being of the order of picoseconds, and each associated pair of pulses being simultaneous over at least a portion of the time duration of one of the pulses,

the laser frequencies being selected so that the frequency $\omega_v = \omega_1 - \omega_2$ is the frequency of an anti-Stokes vibrational level of said specific molecular species, said anti-Stokes vibration of the molecular species emitting radiation of frequency $\omega_3 = 2\omega_1 - \omega_2$, where ω_1, ω_2 and ω_3 are in the "visible" light spectrum; and

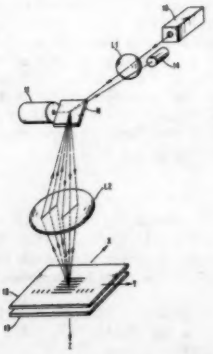
microscope means for imaging the emitted anti-Stokes radiation from the molecular species.

4,405,238

ALIGNMENT METHOD AND APPARATUS FOR X-RAY OR OPTICAL LITHOGRAPHY

Warren D. Grobman, Yorktown Heights; David A. Nelson, Jr., Carmel, and John M. Warlaumont, Croton-on-Hudson, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed May 20, 1981, Ser. No. 265,140
Int. Cl.³ G01B 9/02, 11/00
U.S. Cl. 356—401 15 Claims



1. An alignment system wherein a first element to be aligned carries a Fresnel lens for focusing incident light to line image on a grating mark carried by a second element to be aligned therewith, the grating mark diffracting line image light to a light sensor, said Fresnel lens comprising a plurality of Fresnel zone plates, each said Fresnel zone plate with a common focal

length f_1 and in which said plurality of Fresnel zone plates is arranged as a macro Fresnel zone plate with a focal length f_2, wherein f_2 is not equal to f_1.

4,405,239
ENERGY EFFICIENT EXTRUDER SCREW

Chan I. Chung, 2483 Whitehall Ct., Schenectady, N.Y. 12309, and Robert A. Barr, P.O. Box 4476, Virginia Beach, Va. 23454

Filed Apr. 13, 1982, Ser. No. 368,081
Int. Cl.³ B29B 1/06
U.S. Cl. 366—89 6 Claims

1. A screw used for a single screw extruder which houses said screw rotatably in a cylindrical barrel for plasticating or melting solid plastic material, said screw having a feed end and a discharge end:

said screw embodying a novel mixing section between the feed end and discharge end of said screw comprising: at least one pair of substantially parallel, helical, first and second threads integral with the core of said screw;

said first thread of the pair originating at the feed end of said screw creating a helical channel and having a minimum clearance to said barrel;

said second thread of the pair originating at a location about one third to two thirds of the length of said screw from the feed end of said screw by rising from the core of said screw and having a large clearance to said barrel comparable to or greater than the size of the components of said solid plastic material;

said second thread of the pair dividing said helical channel created by said first thread into two sub-channels of substantially equal width, one located toward the feed end of said screw from said second thread hereinafter called a front sub-channel and the other located toward the discharge end of said screw from said second thread hereinafter called a back sub-channel;

the depth of said front sub-channel gradually increasing to a maximum comparable to the depth of said helical channel at the feed end of said screw accompanied by gradual decrease of the depth of said back sub-channel to a minimum comparable to or greater than the size of the components of said solid plastic material over about one half to one turn of said second thread around the core of said screw, the gradual change being linear, cyclical or any other type as long as the change is gradual;

at the end of the depth reversal of said front sub-channel and said back sub-channel, said second thread converting to become said first thread with a minimum clearance to said barrel and said first thread converting to become said second thread with a large clearance to said barrel, and the maximum depth of said front sub-channel being maintained over about one half to one turn of said first thread around the core of said screw such that at this point the structural features of said screw become substantially similar to those at the beginning of the depth reversal;

then, duplicating the depth reversal between said front sub-channel and said back sub-channel;

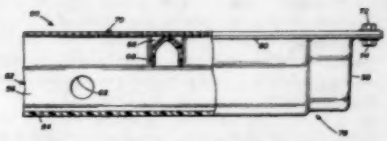
the conversions of said first thread to said second thread and said second thread to said first thread followed by the depth reversal, being repeated as many times as desired but at least once;

and finally, said front sub-channel and said back sub-channel being merged to a single channel with a common depth by gradually changing their depths and eliminating said second thread.

4,405,240
AEROSLIDE CONSTRUCTION

Walter Laidlaw, Dallas, Tex., assignor to Claudius Peters, Inc., Dallas, Tex.

Filed Mar. 31, 1981, Ser. No. 249,716
Int. Cl.³ B01F 13/02; B65G 53/20
U.S. Cl. 366—101 9 Claims



7. An aeroslide comprising a molded plastic base comprising a unitary structure including a bottom wall, side walls extending upwardly from the bottom wall, end walls extending upwardly from the bottom wall and connected to the side walls to enclose the interior of the base, and flanges extending outwardly from the upper ends of the side walls and the end walls to define the upper periphery of the base;

a plurality of indentations formed in the upward portion of each of the side walls at spaced points along the length of the base, each of the indentations formed in one of the side walls being aligned with a corresponding indentation formed in the other side wall;

a plurality of plastic reinforcing members each received and adhesively secured in indentations of the side walls for reinforcing the base;

a layer of porous multiply acrylic belting material extending over and substantially parallel to the bottom of the base and having a periphery coincident with the upper periphery of the base as defined by the flanges;

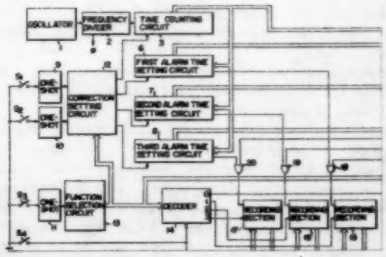
an adhesive layer positioned between the upper surfaces of the flanges and the adjacent undersurface of the layer of porous multiply acrylic belting material for adhesively securing the belting material to the base; and

means for admitting a pressurized fluid into the base so that the fluid flows outwardly through the porous fabric layer.

4,405,241
ELECTRONIC DEVICE HAVING TIMEPIECE FUNCTION

Toshiharu Aihara, Kodaira; Iwao Tahara, Higashiyamato; Yushin Matsuo, Chofu; Naoki Takahashi, Funsa, all of Japan; Takuo Wakabayashi, deceased, late of Saitama, Japan, and Shigemasa Wakabayashi, executor, Nagano, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,044
Claims priority, application Japan, Dec. 11, 1979, 54-161291
Int. Cl.³ G04C 21/32, 21/14
U.S. Cl. 368—63 7 Claims



1. An electronic device having a timepiece function, comprising:

a source of reference frequency signals;

time counting means for counting said reference frequency signals to provide time data;

alarm time storing means including a plurality of alarm time memory sections for storing set alarm times;

voice data storing means including a plurality of voice data storing sections for storing messages corresponding to the respective set alarm times in any order;

voice producing means coupled to said voice data storing means for producing a sound, in the form of voice, corresponding to the message stored in said voice data storing means, when the time data provided by said time counting means reaches a set alarm time stored in said alarm time storing means;

a single external operation switch means which is operable to confirm the contents of the messages stored in said voice data storing means;

memory section designating means coupled to said single external operation switch means for producing a readout designating signal which designated a given order of said voice data storing sections of said voice data storing means for causing the messages respectively corresponding to the set alarm times to be read out in a time sequence of the count times of the timepiece when said single external operation switch means is operated; and

voice producing control means coupled to said memory section designating means and responsive to said readout designating signal for reading out the messages in said given order from said voice data storing sections designated by said memory section designating means on the basis of said readout designating signal, and for causing a sound corresponding to the read out messages to be produced by said voice producing means.

4,405,242

ELECTRONIC DEVICE AND METHOD OF FABRICATING THE SAME

Hideki Kosaka, Kodaira; Tsutomu Mimata, Akikawa; Tsuyoshi Shimizu; Hideharu Yamamoto, both of Tokyo; Kaoru Itoh, Kodaira, and Yasuhusa Shima, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 916,923, Jun. 19, 1978, Pat. No. 4,348,751. This application Oct. 26, 1981, Ser. No. 315,155

Claims priority, application Japan, Jun. 20, 1977, 52-72041; Aug. 10, 1977, 52-95020; Aug. 10, 1977, 52-95021; Aug. 10, 1977, 52-95022; Dec. 9, 1977, 52-147084; Dec. 19, 1977, 52-151762; Dec. 19, 1977, 52-151763; Dec. 23, 1977, 52-154442; Dec. 23, 1977, 52-154443; Dec. 23, 1977, 52-154480; Jan. 20, 1978, 53-4365; May 15, 1978, 53-56697

Int. Cl.³ G04C *19/00, 23/02*

U.S. Cl. 368—82 **10 Claims**

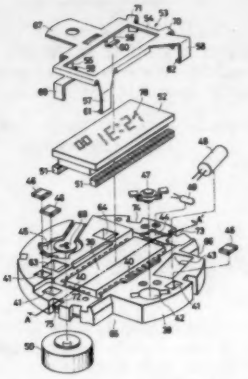
1. An electronic device comprising:

a display device for visibly displaying characters on a viewing surface;

a block having an electrical circuit, including switch terminals extending exteriorly of the block, for driving said display device;

an electrically conductive fitting frame formed from a single sheet of plate-shaped electrically conductive metal adapted to hold said display device and block together in compression, said frame having front portions which serve to retain the display device and to hold a battery within the block, respectively, fixing fit arm members for providing pressure to hold said display device and block together by engagement with said block, and at least one switch portion adapted to contact with a respective one of said terminals of said electrical circuit; and

at least one switch member arranged for bringing said switch portion into contact with said respective terminal,



whereby said electrically conductive frame serves as a wiring for said electrical circuit.

4,405,243

CRYOGENIC IMPACT TESTING METHOD AND MACHINE

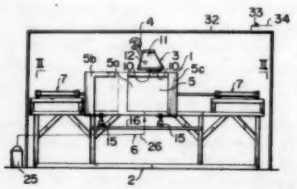
Yasuo Kuraoka, and Norihide Hosoda, both of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Dec. 21, 1981, Ser. No. 334,320

Claims priority, application Japan, Dec. 26, 1980, 55-189139; Oct. 6, 1981, 56-148441[U]

Int. Cl.³ G01N *3/30*

U.S. Cl. 374—46 **4 Claims**



1. A cryogenic impact testing method of Charpy's and falling weight types comprising the steps of

enclosing a testing space in a heat insulating box having an openable passage while a test piece is set on a supporting base,

atomizing low temperature liquefied gas onto the test piece,

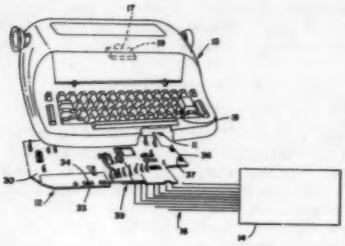
opening the passage only sufficient for a hammer or a falling weight in the heat insulating box synchronously with the impacting operation of the hammer or the falling weight when the test piece reaches a set predetermined temperature, and

conducting the impact testing of the test piece while continuing the atomizing of the low temperature liquefied gas even in the open state of the passage.

4,405,244
TYPEWRITER OPERATING ATTACHMENT PROVIDING FOR DEAD KEY OPERATIONS

Lawrence Holmes, Jr., 91 Highwood Ave., Midland Park, N.J. 07432

Filed Jul. 21, 1981, Ser. No. 285,503
Int. Cl.³ B41J 5/30
U.S. Cl. 400—66 12 Claims



1. In an attachment for generating sets of electrical signals which identify successive character printing operations at a typewriter and for initiating operations of a typewriter in response to such sets of electrical signals which identify successive printing operations to be performed, the typewriter having escapement means for causing character spacing movement to a succeeding character space following printing of a character in response to a set of print signals, the improvement comprising:

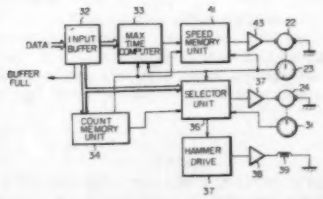
said attachment having control means for optionally adding a dead key bit to selected ones of said print signal sets, and

said attachment being provided with dead key means for temporarily disabling said escapement means of said typewriter in response to sets of said print signals which include said dead key bit.

4,405,245
VARIABLE SPEED SIGNAL PRINTING APPARATUS

Takashi Fukushima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 60,096, Jul. 24, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,483
Int. Cl.³ B41J 1/08
U.S. Cl. 400—144.2 6 Claims



1. A serial printing apparatus constructed to receive serial data including character data and non-character data, the apparatus including a carriage, variable speed drive means for driving the carriage, a rotary printing element mounted on the carriage and selector means mounted on the carriage for rotating the printing element to a printing position which is a predetermined function of a character data fed to the selector means, characterized by comprising;

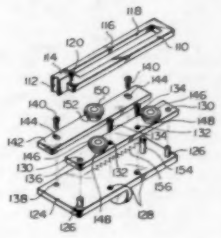
computing means for discriminating all consecutive character data between two non-character data and computing a length of time required for the selector means to rotate the printing element from a previous printing position to a new printing position for each of the consecutive character data and storing a computed maximum length of time; and

speed control means responsive to the computing means for controlling the drive means to drive the carriage at a speed corresponding to the computed maximum length of time while the consecutive character data are fed to the selector means for printing.

4,405,246
HAMMER DEVICE FOR PRINTER

Masayuki Suzaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,118
Claims priority, application Japan, Oct. 21, 1980, 55-147482
Int. Cl.³ B41J 9/38
U.S. Cl. 400—144.2 7 Claims



1. In a serial printer having a type wheel which is provided with a multiplicity of radially arranged fingers each carrying at least one type on a front face thereof and a fount detent on a back which is positioned coaxially with the type, a hammer device comprising:

(a) a support member mounted on a frame of a carriage;

(b) an impacting means movably mounted on said support member for translation between a first position where it is clear of a fount detent and a second position where it is engaged with the fount detent at one end thereof;

(c) guide means with which the impacting means are slidably engaged to be thereby guided during translation between the first and second positions;

(d) drive means for driving the impacting means from the first position to the second position;

(e) a tension spring for constantly biasing the impacting means toward the first position; and

(f) positioning means for accurately positioning the impacting means in predetermined vertical and transverse orientations;

the guide means for guiding the translation of the impacting means comprising at least two rotary bearings each with a flange which constitute a reference side for the translation of the impacting means and at least one rotary bearing with a flange which defines the other side for the translation;

the positioning means comprising a first plate fixed in place on the support member and a second plate fixed in a place adjustable transversely toward and away from said first plate, said first plate carrying the two rotary bearings at the reference side thereon and said second plate the single rotary bearing so as to cooperate with the flanges of the rotary bearings.

4,405,247

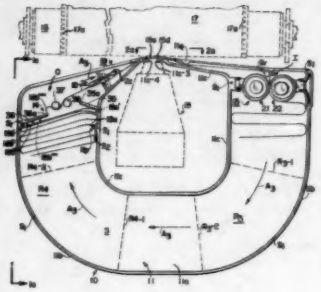
FULLY SELF-CONTAINED DISPOSABLE CARTRIDGE FOR INKED RIBBONS AND THE LIKE

Samuel Y. Hanna, Nashua, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Continuation of Ser. No. 912,077, Jun. 5, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,496

Int. Cl.³ B41J 33/10

U.S. Cl. 400—196.1 2 Claims



1. A ribbon cartridge for use in printers having a print head assembly including a nose, and a paper support movable relative to one another to effect printing at a printing location by printing means located at the nose of the print head assembly, said cartridge comprising:

a closed loop of ribbon;

a housing having a hollow interior, a portion of said interior forming a substantially U-shaped ribbon storage region having inlet and outlet ends at the opposite ends of said U-shaped storage region and being defined by top and bottom walls joined by spaced-apart inner and outer U-shaped side walls;

drive means forming part of said cartridge at the inlet end of said storage region for driving the ribbon into the storage region to engage stripper means for imparting to the ribbon a full fan-fold configuration whereby opposite folds of ribbon extend towards said inner and outer side walls of said housing;

the inlet and outlet ends of said ribbon storage region being substantially coplanar and on opposite sides of the nose of said print head assembly;

said housing also including a hollow ribbon guiding channel spanning between and being substantially coplanar with said outlet and inlet ends of said storage region for guiding said ribbon from said outlet end to said ribbon driving means, said guiding channel having an opening coinciding with the position occupied by the nose of the print head assembly to expose a portion of the ribbon extending across the guiding channel for engagement by said printing means;

said spaced-apart inner and outer U-shaped side walls being spaced apart a sufficient distance to receive said ribbon in said full fan-fold configuration from said inlet end to said outlet end;

means located at the outlet end of said storage region for guiding the ribbon out of said storage region and including a first opening through which said ribbon passes and second and third openings on opposite sides of said first opening for accommodating opposite folds of the stored fan-fold ribbon in an alternating fashion as the ribbon is drawn through said first opening by said drive means, said first opening being defined by first and second spaced-apart projections arranged intermediate the side walls of the housing;

a third projection extending inwardly from said inner side wall towards said first projection to define said second opening;

a fourth projection extending inwardly from said outer side wall towards said second projection to define said third opening, the distance measured across said first opening being significantly greater than the thickness of the ribbon and being so constructed to prevent the ribbon from being creased in the event that multiple plies of the ribbon pass therethrough; and

said guiding channel and said U-shaped storage region cooperating to form a central opening for surrounding said print head assembly and the nose of said print head assembly.

4,405,248

ADVANCING DEVICE IN ELECTRICALLY DRIVEN TYPEWRITERS AND SIMILAR MACHINES

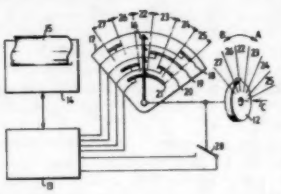
Klaus Wunderlich; Udo Schlegel, and Heinz Ricke, all of Brunswick, Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,154

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039789

Int. Cl.³ B41J 11/36, 19/14

U.S. Cl. 400—550 17 Claims



1. In an advancing device for the motorized vertical forward or reverse movement of a record carrier in an electrically driven office machine, which device includes an operating element mounted for displacement in either one of two directions from a zero position, and means responsive to displacement of the operating element in a first one of the two directions for effecting forward vertical movement of such carrier and responsive to displacement of the operating element in the second one of the two directions for effecting reverse vertical movement of such carrier, the improvement wherein said means are responsive to displacement of said operating element in the first direction to at least three successive distances from the zero position for moving the record carrier at a rate which increases between at least three values which increase successively from one value to the next as the extent of displacement of said operating element from the zero position increases from one successive distance to the next, with each successive distance being associated with a respective one of the three rate values.

4,405,249

DISPENSING APPARATUS AND METHOD

John T. Scales, Stanmore, England, assignor to National Research Development Corporation, London, England

Filed Mar. 19, 1981, Ser. No. 245,606

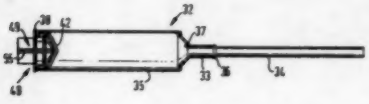
Claims priority, application United Kingdom, Mar. 28, 1980, 8010522

Int. Cl.³ B43K 5/06

U.S. Cl. 401—182 7 Claims

1. A disposable syringe for use with a non-disposable injection gun for dispensing bone cement which is flowable under pressure comprising a body having an internal bore with an outlet at one end of the bore and a piston having a front face for expressing viscous flowable material through the outlet by advancement of the piston towards the outlet and contact at

the front face of the piston with the flowable material and a rear face, wherein said front face is deformable and generally conically shaped with apertures therethrough which are of a size such as to allow passage of a gas but to substantially prevent passage to the viscous flowable material to said non-disposable injection gun, and one or more forward chambers are



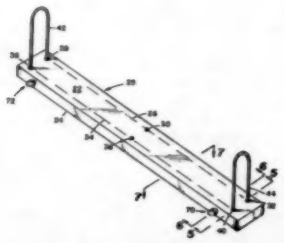
defined within the piston into which said apertures debouch, and gas flow communication from said chambers to the rear face of the piston, whereby gas but not flowable material passes to the rear face of the piston during expression of the material through the outlet, said piston because of its deformability and generally conical shape deforming radially outwardly under load to sealingly engage the wall of said bore.

4,405,250

ADJUSTABLE LOOSELEAF BINDER

Knoeng F. Wu, 11704 Bunting Dr., Knoxville, Tenn. 37922

Filed Aug. 25, 1981, Ser. No. 296,149
Int. Cl.³ B42F *13/02*
U.S. Cl. 402—13 **12 Claims**



1. An adjustable looseleaf binder for the releasable accumulation of sheets of paper and the like having holes punched at a specific spacing along one edge thereof, which comprises:

an elongated base plate having a thickness defined by substantially parallel top and bottom surfaces, said base plate being provided with parallel first and second rows of apertures along its length extending from said top surface through at least a portion of said thickness, the spacing between apertures in each of said rows corresponding to said selected spacing of punched holes, said base plate being further provided with a passageway substantially oriented along the length of said base plate communicating with each of said apertures in said second row;

a plurality of unitary flexible binding posts to penetrate such punched holes, one end of each of said binding posts being secured in a selected one of said apertures in said first row; and

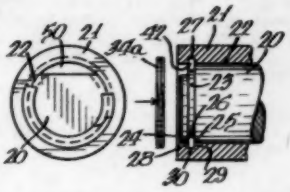
a locking element associated with said passageway for releasably engaging a second end of said binding posts when said second end is inserted within said passageway.

4,405,251

RETAINING RING LOCKING DEVICE

Abel E. Kolchinsky, Glenview; John Boullan, and Wayne Davis, both of Bensenville, all of Ill., assignors to Miller Fluid Power Corporation, Bensenville, Ill.

Continuation of Ser. No. 128,358, Mar. 6, 1980. This application Jan. 18, 1982, Ser. No. 339,872
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—9 **7 Claims**



1. Retaining ring structure for holding a shaft within a bore in a device against longitudinal relative movement, comprising:

a retaining ring;

means on said shaft defining an external circumferential groove having axially opposite sidewalls; and

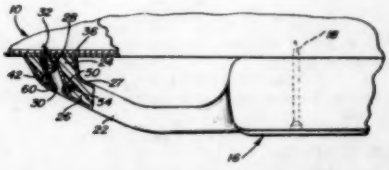
means on said device defining an internal circumferential bore groove having axially opposite sidewalls complementary to said shaft groove to define a substantially closed ring receiving groove means when the shaft and bore grooves are disposed radially opposite each other, said shaft having a chordal portion contiguous its end removed so as to provide with said device at least one access opening extending axially inwardly from an end thereof to said ring receiving groove means for exposing a portion of said ring receiving groove means from said end whereby the radially unexpanded retaining ring may be threaded from axially outwardly of said end through said opening into said ring receiving groove means for locking said device and shaft against both axially inward and axially outward displacement.

4,405,252

METHOD AND APPARATUS FOR VEHICLE DOOR ARM REST ANCHOR REPAIR

J. W. Easterling, 617 Mercury, Altus, Okla. 73521

Filed Feb. 17, 1982, Ser. No. 349,581
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—11 **5 Claims**



1. For use with an article including a fastener receiving bore formed therethrough and wherein said bore includes an enlarged counterbore at one end extending inwardly of said one end of said bore, terminates inwardly only a slight distance from the other end of said bore and defines an axially thin shoulder of the material of which the adjacent portion of said articles is constructed surrounding said bore against which an article retaining head of a fastener secured through said bore may seat, a repair structure for use when said shoulder has been partially or fully broken away, said repair structure in-

cluding a sleeve to be snugly received and seated in said counterbore and including an end wall on the end of the sleeve opposing the shoulder with the end wall including a central aperture formed therethrough, the end portion of said sleeve remote from said end wall being beveled, the beveled end of said sleeve including a generally radial bore spaced inwardly of the tip end thereof, a first fastener securable through said aperture and a second fastener securable through said bore.

4,405,253

CONNECTION BETWEEN TWO ELEMENTS

Bernt I. Stockum, Fuxgatan 15, S-212 35 Malmö, Sweden

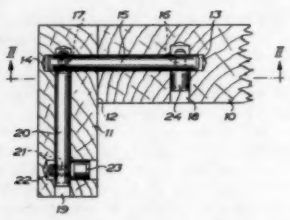
PCT No. PCT/SE79/00141, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO80/02866, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 20, 1979, Ser. No. 237,166

Claims priority, application Sweden, Dec. 20, 1977, 7714487

Int. Cl.³ B25G *3/00*; F16B *7/08, 9/00*; F16L *41/00*

U.S. Cl. 403—231 **4 Claims**



1. A connector which tightly and adjustably fastening together first and second directly-abutting elements of wooden furniture, comprising a substantially straight rod having first and second transverse bores therethrough, one portion including the first transverse bore extending into a first passage in the first element, and another portion including the second transverse bore extending into a second passage in the second element; a cross rod extending through a cross passage in the first element with one end passing into the first transverse bore, thereby retaining the rod in position in the first passage; a cross pin having an eccentric rotatably received in a cross passage in the second element, the pin extending to the second transverse bore of the rod; the cross rod and the cross pin locking the rod into a position fastening the first and second elements together, and the cross pin and eccentric drawing the first and second elements tightly together in an engagement that is adjustable according to the rotated position of the eccentric in the cross passage.

4,405,254

SCAFFOLDING

Jack R. Tooley, Cobham, England, assignor to Acrow Limited, London, England

Filed Jun. 11, 1981, Ser. No. 272,512

Claims priority, application South Africa, Oct. 27, 1980, 80/6590

Int. Cl.³ E04G *7/00*

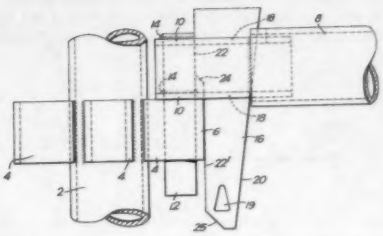
U.S. Cl. 403—246 **7 Claims**

1. A scaffolding clamp device comprising

a cross member having a first contact surface and a second contact surface, both of said contact surfaces being adjacent one end of said member,

a spigot connected to said cross member at the same end thereof as said contact surfaces,

a wedge positioned between said first contact surface and said spigot, said wedge defining a two section surface adjacent said spigot, one section of said surface being stepped inwardly from the other section of said surface by a distance equal to the distance between said spigot and the other section of said surface when said wedge is in its clamping position against said first contact surface, and



a projection mounted on said wedge, said projection being wedged against said second contact surface to hold said wedge in a non-clamping position when said wedge is withdrawn from its clamping position.

4,405,255

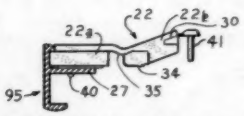
ATTACHMENT OF FRAME SECTIONS

Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005

Filed Feb. 2, 1982, Ser. No. 344,888

Int. Cl.³ G09F *1/12*

U.S. Cl. 403—402 **21 Claims**



1. A locking bracket adapted to join together two metallic frame members forming an L-shaped joint, said members having channel shaped cross sections, comprising

(a) an L-shaped non-metallic body with legs formed for reception into the respective members to bridge said joint,

(b) the legs having sections that taper in downward directions of reception into said members for interference interfit with shoulders defined by said members,

(c) the legs having ledges that face in upward directions opposite to said downward directions to fit closely under and forcibly engage shoulders on member flanges in response to completed reception of the legs into said members,

(d) and ribbing on and projecting downwardly from said legs to compressively engage member webs so that said ledges will forcibly engage said member flanges.

4,405,256

CUSHIONED FASTENER JOINT

John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342

Filed Apr. 14, 1981, Ser. No. 254,324

Int. Cl.³ F16B *19/00*

U.S. Cl. 403—408 **9 Claims**

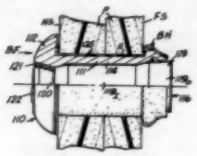
7. A joint construction including:

composite material workpieces each defining a hole therethrough of a first prescribed diameter;

a fastener through said holes having a bearing section within said holes of a second prescribed diameter smaller than said first prescribed diameter;

a metal sleeve member within said holes around said bearing section of said fastener and including a radially expanded continuous tubular side wall in bearing contact with said bearing section of said fastener, said tubular side wall having a third prescribed outside diameter smaller than

said first prescribed diameter and having a prescribed side wall thickness less than the threshold thickness of the material of said sleeve member below which insignificant material flow within said side wall occurs under load; and a compressible cushion within said holes between said sleeve member and said workpieces and substantially filling the space between said sleeve member and said workpieces within said holes, said cushion having been placed in said hole while on said metal sleeve member while said cushion was uncompressed and had an initial outside diameter smaller than the hole diameter and subsequently forced



into contact with the hole surface and compressed by radially and circumferentially expanding said tubular side wall of said sleeve member, said fastener maintaining said sleeve member radially and circumferentially expanded so that said cushion is compressed to a compressed thickness such that insignificant material flow within said cushion takes place under load and so that said cushion is maintained under sufficient compression between said sleeve member and said workpieces to cause the operating load of the joint to be transferred from said workpieces to said fastener through said cushion and said sleeve member.

4,405,257

SAFETY MAT FOR USE IN PROTECTION OF WATERWASHED AREAS AGAINST EROSION AND/OR UNDERMINING

Erik Nielsen, Frederikshavn, Denmark, assignor to Daekko Presenning Kompagni A/S, Broenshoej, Denmark

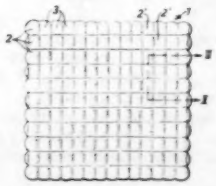
PCT No. PCT/DK80/00027, § 371 Date Dec. 22, 1980, § 102(e) Date Dec. 22, 1980, PCT Pub. No. WO80/02436, PCT Pub. Date Nov. 13, 1980

PCT Filed May 1, 1980, Ser. No. 227,105

Claims priority, application Denmark, May 3, 1979, 1828/79; Apr. 22, 1980, 1718/80

Int. Cl.³ E02B *3/12*

U.S. Cl. 405—19 **2 Claims**



1. A safety mat for use in protection of waterwashed areas against ground deformation, wherein the mat includes a number of substantially parallel, elongated hollow members, tapes interconnecting said substantially parallel members and a filling material disposed within said hollow members, said filling material comprising a mixture of pearl gravel and granulated polystyrene with an average density of 1.6 kg/dm³ and filling the tubular members to about 75 percent capacity with the pearl gravel disposed at the ends of the tubular members and the granulated polystyrene between the ends.

4,405,258

METHOD FOR CONTAINING OIL AND/OR GAS WITHIN A BLOW-OUT COVER DOME

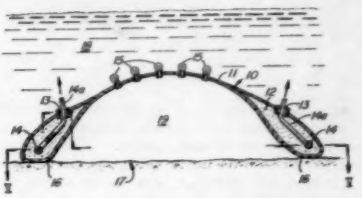
Cameron O'Rourke, and Roger Pilkington, both of Calgary, Calif.X, assignors to Dome Petroleum Limited, Canada

Continuation-in-part of Ser. No. 112,720, Jan. 16, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,930

Claims priority, application Canada, Oct. 24, 1977, 289297

Int. Cl.³ E02B *15/04*; E02D *23/02*

U.S. Cl. 405—60 **9 Claims**



1. A method for containing a lighter-than-water fluid at a predetermined location on the seabed, which method comprises:

(A) deploying a containment dome in shallow water near said predetermined location on the seabed, said containment dome having an upper expanded dome-like fluid impervious membrane, a fluid impervious hollow peripheral ring attached to the periphery of the membrane to provide a depending bag-like container and water drainage means located within said bag-like container for connection to pump conduit means;

(B) pumping wet sand from said seabed into said bag-like container, draining water from said wet sand through said water drainage means, so as thereby to provide a body of drained sand disposed within said bag-like container, thereby providing said hollow peripheral ring as a self-supporting structure hollow peripheral torus and as an anchor for said dome-like structural unit;

(C) charging said containment dome with a buoyant amount of air;

(D) floating said buoyed dome out to the site where said containment dome is to be located;

(E) submerging said containment dome by controllably releasing said air while substantially simultaneously filling said containment dome with water, thereby sinking said containment dome until said peripheral hollow torus rests on the seabed at said predetermined location;

(F) capturing said lighter-than-water fluid in said dome while substantially simultaneously displacing water from within said dome with said lighter-than-water fluid.

4,405,259

METHOD AND APPARATUS FOR PREVENTING FOREIGN OBJECTS FROM ENTERING INTO DOCKING BASINS

Veikko Koskivirta, Vantaa, and Antti Haanterä, Helsinki, both of Finland, assignors to Valmet Oy, Finland

Filed Jan. 27, 1981, Ser. No. 228,727

Claims priority, application Finland, Jan. 29, 1980, 800260

Int. Cl.³ E02B *15/00*

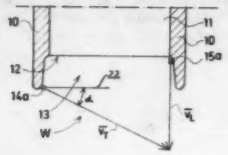
U.S. Cl. 405—62 **11 Claims**

1. A method for preventing foreign objects, such as ice floes, from entering through a two-sided inlet into the docking basin of barge supporting floater-type vessels, floating docks, basin docks, canal sluices or the like, comprising the steps of:

directing a first strong, relatively narrow surface water current in an outward direction with respect to the docking basin from the region of one side of the inlet, said first surface current defining an angle in the range of about 15°

to 35° with respect to a transverse plane passing through the inlet sides so as to constitute a transverse current; and

directing a second strong, relatively narrow surface water current in an outward direction with respect to the docking basin from the region of the other side of the inlet, said



second surface current being directed substantially normal to the transverse plane passing through the inlet sides so as to constitute a rearward current;

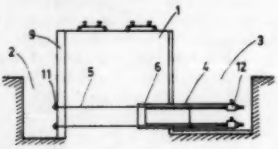
whereby a flow field is created by the transverse and rearward currents which prevents foreign objects from entering into the docking basin through the inlet.

4,405,260

METHOD OF CONSTRUCTING UNDERPASS ACROSS RAILWAY AND HIGHWAY WITHOUT AFFECTING NORMAL TRAFFIC THEREOF

Tepin Tsai, 4th Fl., 114 Fu-Hsing South Rd., Sec. 2, and Teh-Chung Tsai, 35 Chung-Hsiao East Rd., Sec. 4, both of Taipei, Taiwan

Filed Jun. 22, 1981, Ser. No. 275,771
Int. Cl.³ E21D *9/00*
U.S. Cl. 405—184 **6 Claims**



1. A method of constructing an underpass comprising the steps of;

tracting a plurality of precast box culverts into the road foundation one after another in conjunction with the construction line thereof so that a predetermined inverse U-shape structure is formed therein;

building prestressed beams and support constructions against the section plane of said U-shape structure of the precast box culverts; and

directly excavating the earth volume under the U-shape structure of the precast box culverts according the predetermined passage thereof, said tracting being further characterized by including the steps of

excavating a traction ditch along one side of the road foundation and a launching ditch on the other in sufficient width as to accommodate at least two precast box culverts and the working people thereof;

building a concrete traction wall in said traction ditch along the road foundation with a plurality of traction holes preformed in said traction wall relativve to the locations of the preformed holes in the precast box culverts;

perforating horizontally from said traction hole of the traction wall through the road foundation toward said launching ditch until the point of the perforating device reached at the tail end of the precast box culvert through the preformed hole aligned thereat;

tying a steel cable at the point of the perforating device from the tail end of the precast box culvert in said launching ditch, pulling back the perforating device to said traction ditch, and fastening the cable end on said traction wall by an anchoring fitting;

securing the other end of said steel cable on a traction jack attached to the preformed hole on the tail end of the precast box culvert;

repeating the same steps of perforating, anchoring, and securing for the remaining preformed holes of the precast box culvert;

placing a steel knife edge on the advancing end of the precast box culvert; and

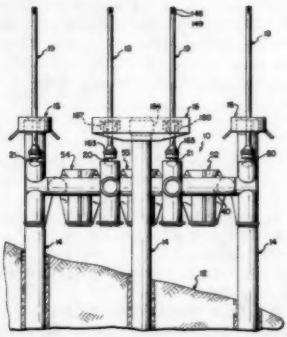
actuating said traction jacks secured on the tail end of the precast box culvert to tract said steel cables simultaneously in a direction toward said traction wall through the road foundation along with the construction line thereof so that the precast box culvert is correctly tracted into the road foundation.

4,405,261

SUBSEA TEMPLATE LEVELLING SYSTEM AND METHOD

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Apr. 22, 1981, Ser. No. 256,507
Claims priority, application United Kingdom, Apr. 14, 1981, 8111788
Int. Cl.³ E02D *5/00, 5/74;* E21B *33/047*
U.S. Cl. 405—227 **22 Claims**



1. A template levelling system for levelling a template on a plurality of suspension joints implanted in the floor of a body of water, the combination comprising:

a plurality of passageways formed in the template, each of the suspension joints passing through one of said passageways and extending above the template;

a pair of guideposts pivotally coupled to the template adjacent each of said passageways;

a handling string movable through the water;

a hydraulic jack coupled to said handling string and including an inner member slidably received in an outer member;

an articulated tension beam pivotally coupled to said inner member;

a pair of tension joints;

means for pivotally and releasably coupling said tension joints to said articulated tension beam;

means for coupling said pair of tension joints to a pair of said guideposts;

a support beam coupled to said suspension joint and releasably coupled to said outer member; and

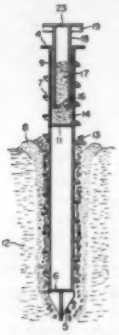
means, on said support beam, for releasably coupling said tension joints to said support beam.

4,405,262

METHOD FOR ERECTION OF A TEMPORARY BRIDGE, AND A PILE MEANS THEREFOR

Masaya Nagashima, 4-6, Takayanagi 3-chome, City of Kisarazu, Chiba Prefecture, Japan

Filed Oct. 1, 1980, Ser. No. 192,691
Claims priority, application Japan, Jan. 8, 1980, 55-663
Int. Cl.³ E02D 5/56
U.S. Cl. 405—221 4 Claims



1. A pile means for a temporary structure comprising a pile member, a height adjusting member and a supply of sand, said pile member comprising a hollow cylindrical pile body made of metal and having a desired length with its upper and lower end being opened and closed, respectively, a spiral propelling element provided on the outer periphery of said pile body over substantially its entire length, a flange at its upper end adapted to engage a prime mover, and a partition plate provided inside said pile body at its upper portion so as to form a height adjusting chamber above said partition plate to receive said height adjusting member and said supply of sand, and said height adjusting member comprising a hollow cylinder made of metal and having an outer diameter somewhat less than the inner diameter of said pile body as well as a height somewhat higher than the depth of said height adjusting chamber of said pile body, whereby the lower end of said hollow cylinder is closed by a bottom in which a sand discharge orifice is drilled therethrough, while the upper end of said hollow cylinder is provided with a base plate in which a sand supply orifice is drilled therethrough, said bottom being configured to rest upon said supply of sand in said height adjusting chamber to support said height adjusting member at a predetermined height within said height adjusting chamber.

4,405,263

UNDERWATER DEVICES WITH REMOTELY OPERATED LATCH MEANS

Douglas D. Hall, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Dec. 14, 1981, Ser. No. 330,725
Int. Cl.³ E02D 5/74
U.S. Cl. 405—224 25 Claims

1. In a device for at least positioning a wireline or the like in a socket member when the socket member has a bore and a transverse annular latch groove opening into the bore, the combination of

at least two mutually complementary bushing members constructed to be fitted together in side-to-side relation to define a hollow bushing, each bushing member having

an outer surface which constitutes part of a cylindrial surface of a diameter to fit within the bore of the socket member,

an inner surface,

first and second end portions,

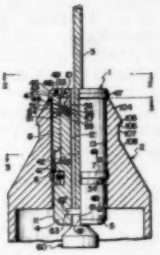
an outwardly opening recess located intermediate the end portions, and

a longitudinal retaining and guiding passage opening at one end through the first end portion and at the other end into the outwardly opening recess;

means for releasably retaining the bushing members in positions fitted together about the wireline or the like;

a plurality of latch retracting plungers each slidably retained in a different one of the retaining and guiding passages;

a plurality of latch members each located in the outwardly opening recess of a different one of the bushing members and movable laterally of the bushing member between a



retracted inactive position and an outwardly projecting active position, each of the latch members having

an outer portion dimensioned to cooperate with the latch groove of the socket member when the latch member occupies its active position, and

an inclined camming surface which extends across the respective retaining and guiding passage when the latch member is in its active position and is oriented to cam the latch member toward its inactive position when the respective plunger is driven against the camming surface; and

yieldable means operatively associated with the latch members to bias the latch members to their active positions.

4,405,264

METHOD OF PROVIDING EARTH COVERING USEFUL FOR WATER HARVESTING

Sam A. Brady, and Michael G. Elias, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 30, 1981, Ser. No. 288,253
Int. Cl.³ E02B 5/02
U.S. Cl. 405—270 33 Claims

1. A method of constructing a means suitable for directing, transporting, or holding water comprising

(A) laying cloth upon a surface, said surface being convenient to a depression suitable to direct, transport, or hold water, then

(B) coating the cloth with a liquid silicone elastomeric composition curable at atmospheric conditions to an elastomer having a modulus which provides sufficient flexibility to the coated cloth so that the coated cloth will assume the contour of the depression, the amount of liquid silicone elastomeric composition being insufficient to cause bonding to the underlying surface,

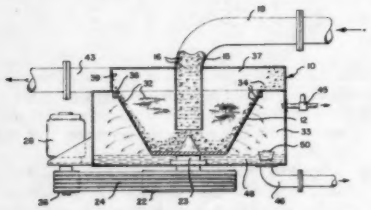
(C) allowing the coated cloth to cure, the cured cloth being impervious to liquid water,
(D) moving the cured, coated cloth to the depression, then
(E) placing the coated cloth into the depression where the coated cloth assumes the contour of the depression, then
(F) bonding the coated cloth at seams, and
(G) stabilizing the coated cloth at unseamed edges to yield a means suitable for directing, transporting, or holding water having a covering impervious to liquid water.

4,405,265

METHOD AND APPARATUS FOR THE CONTINUOUS TRANSFER OF PARTICULATES FROM A LIQUID CONVEYING MEDIUM TO A GASEOUS CONVEYING MEDIUM

John E. Powell, and Andrian J. C. Powell, both of Pittsburgh, Pa., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 18, 1981, Ser. No. 245,078
Int. Cl.³ B046 *15/08*
U.S. Cl. 406—109 **8 Claims**



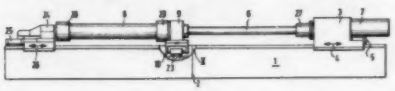
1. A centrifugal machine for transferring particulates from liquid conveying medium to gaseous conveying medium, comprising:
(a) an air-tight housing,
(b) a conical centrifuge basket rotatably mounted at its apex within said housing, said basket being open opposite its apex and having a plurality of holes sized so that a liquid conveying medium may pass through said basket leaving deliquified particulates in contact with the walls of said basket,
(c) an air-tight pick-up chamber attached to said housing and surrounding the open end of said basket to accumulate deliquified particulates,
(d) an input means attached to said pick-up chamber for inputting a pneumatic path of gaseous conveying medium around said basket in the same direction as said basket rotates,
(e) an output means attached to said pick-up chamber for outputting a pneumatic path of gaseous conveying medium, said output means positioned with respect to said input means so as to promote the travel of said pneumatic path through said pick-up chamber in a circumferential manner about the open end of said basket so that deliquified particulates moving with a velocity having a radial component and a tangential component are received by the gaseous conveying medium, the tangential velocity component of said particles is abetted by the pneumatic path of the gaseous conveying medium and the radial velocity component of said particles is neither abetted nor hindered by the pneumatic path of the gaseous conveying medium, and
(f) a channeling means attached to the exterior of the apparatus by which a liquid conveying medium is injected into the base of said centrifuge basket.

4,405,266

DEEP DRILLING MACHINE

Willi Hansen; Bernard Kunze, and Matthias Hermanns, all of Erkelenz, Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellshaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,272
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935766
Int. Cl.³ B23B *51/06, 5/00;* **B27C** *9/04*
U.S. Cl. 408—56 **4 Claims**



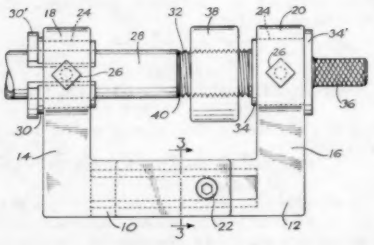
1. A deep drilling machine comprising, in combination, an elongate base, a headstock at one end of said base, a tailstock at the other end of said base, chuck means on said headstock, drive means on said headstock for rotating said chuck means about an axis parallel to said base, feed drive means interposed between each of said headstock and said tailstock and said base for independently shifting said headstock and tailstock axially of said base, a coolant supply apparatus mounted on said base at a generally central position thereon, a workpiece seating device mounted on said coolant supply apparatus for rotation about an axis coincident with the axis of rotation of said chuck means, and mounting means interposed between said workpiece seating device and said base, said mounting means including a pivot for selectively positioning said seating device between said coolant supply apparatus and said tailstock on the one hand and said coolant supply apparatus and said headstock on the other hand, said coolant supply apparatus and workpiece seating apparatus being mounted to be shiftable in the direction of the axis of said chuck means, the combination including preload means opposing shifting movement of said seating device.

4,405,267

THREADING DEVICE

Donald R. Stoken, 1040 Eighth Ave. No. 3, Longview, Wash. 98632

Filed Aug. 17, 1981, Ser. No. 293,377
Int. Cl.³ B23G *1/30, 1/46, 1/48, 1/52*
U.S. Cl. 408—101 **5 Claims**



1. A device for threading a length of pipe or rod material, comprising:
(a) a frame,
(b) a threaded die guide shaft,
(c) a thread-cutting die mounted on said threaded die guide shaft for movement along the threads thereof,
(d) shaft mounting means mounted on said frame for releasably securing said threaded die guide shaft thereto, and
(e) material mounting means on said frame for releasably securing a length of material to be threaded in end abut-

ment and axial alignment with said threaded die guide shaft for enabling transfer of said thread cutting die from said threaded guide shaft onto said material to effect threading thereof.

4,405,268

TOOL HEAD

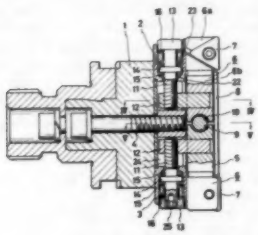
Hitoshi Abe, Utsunomiya, Japan, assignor to Kyoritsu Seiki Corporation, Tochigi, Japan

Filed Dec. 29, 1980, Ser. No. 220,979

Claims priority, application Japan, Dec. 29, 1979, 54-181927[U]; Dec. 29, 1979, 54-181928[U]

Int. Cl.³ B23B *29/03*

U.S. Cl. 408—182 **4 Claims**



1. A tool head comprising:

an arbor having a groove defined on an end surface thereof;

a holder main frame fixed into said groove of said arbor, said main frame having a cylindrical hole bored therethrough in a longitudinal direction and plural chambers adjacent thereto;

plural cutting insert holders radially, slideably fitted in said cylindrical hole;

plural female screws each fitted to one of said holders and extending into one of said chambers; and

means for radially adjusting the position of each of said holders, each said means for adjusting comprising:

a tapered surface at a bottom of a stepped-open bore in said main frame which extends into one of said chambers, said stepped bore having an axis parallel to said cylindrical hole;

an adjusting screw positioned in said stepped bore and extending into said one of said chambers, said adjusting screw tightly threadingly engaging the female screw which extends into said one of said chambers, said adjusting screw having a drum portion with a diameter and a thrust collar with a diameter larger than that of said drum portion, said thrust collar being positioned on said drum portion adjacent said tapered surface of said stepped bore;

a fastening screw threadingly received in a portion of said stepped bore opposing said tapered surface; said fastening screw having a tapered bottom surface facing said thrust collar, said drum portion of said adjusting screw being freely received in a center portion of said fastening screw; and

a plurality of steel balls interposed between said thrust collar and said tapered surface of said main frame, and between said thrust collar and said tapered bottom surface of said fastening screw, whereby shake in both the axial and radial directions of the adjusting screw is eliminated.

4,405,269

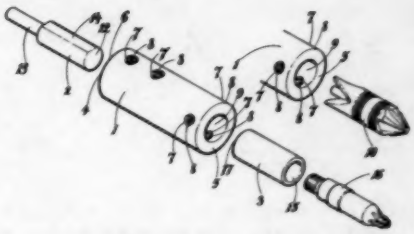
CARTRIDGE CASE REFINISHING SET

Bruce Hertzler, Rt. 5 Box 5400, Albuquerque, N. Mex. 87123

Continuation-in-part of Ser. No. 144,618, Apr. 28, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,171

Int. Cl.³ B23B *51/08, 51/12*

U.S. Cl. 408—211 **2 Claims**



1. A cartridge refinishing set for use on the shaft of an electric motor, said set comprising an adapter barrel, said adapter barrel being generally cylindrical in shape, and having a power end and a tool end, and wherein the adapter barrel has a small cylindrical bore in the power end, said small cylindrical bore being sized to slideably mate on the shaft of an electric motor, and wherein the adapter barrel has a large counter bore in its tool end, and wherein the surface formed where the large center bore and the small cylindrical bore is a shoulder and wherein the large center bore is sized to slideably accept a double ended burring tool, and the shoulder is situated so that when the burring tool is installed the operating end of the burring tool provides sufficiently, and the non-operating end is sufficiently inside the adapter barrel, and wherein the adapter barrel has a plurality of tapped holes from its external surface through the wall of the adapter barrel into the smaller cylindrical bore and into the large center bore, said tapped holes being threaded and sized to accept Allen set screws; and

an adapter sleeve being generally cylindrical in shape and having an external diameter such that the adapter sleeve slideably inserts into the large cylindrical bore of the adapter barrel, and the adapter sleeve having in one end a center bore sized to slideably accept a primer pocket reamer of known construction, and the adapter sleeve having in the other end a tapped and threaded hole, which threadably and mateably will accept the threaded end of the primer pocket reamer; and

a case spinning tool which has a conical section and a stem wherein the tip of the conical section is sufficiently sharp so that the neck of a cartridge may be applied over the tip, and the stem mates with the adapter sleeve; and

a double ended deburring tool; and a primer pocket reamer.

4,405,270

POT BROACH MACHINE WITH TURN-OVER LOADER

Leonard A. Gabriele, , Warren, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 17, 1981, Ser. No. 293,674

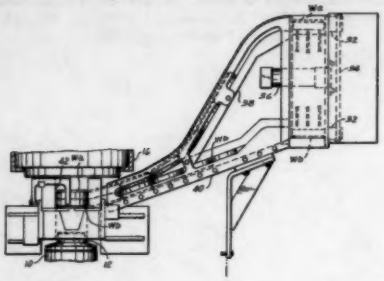
Int. Cl.³ B23D *37/12;* B23F *5/28*

U.S. Cl. 409—244 **10 Claims**

1. The method of broaching a succession of pairs of stacked work pieces each of which is of generally cylindrical shape having one flat side and a lateral projection at the opposite side which comprises:

advancing a series of work pieces in a single continuous array with their edges in contact and with all work pieces with like orientation with respect to the location of the lateral projections thereon,

separating the work pieces as they advance into two groups, inverting all of the work pieces in one group,



stacking the work pieces in pairs, with one work piece from each group and with the flat sides thereof in contact, and successively pot broaching the pairs of stacked work pieces.

4,405,271

CONVERTIBLE RAIL-HIGHWAY VEHICLE CHASSIS

Albert Adams, c/o Transciterne S.A. B.P. 49, 1211 Geneve 13, Switzerland

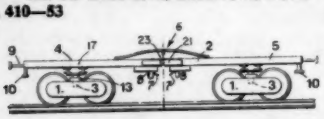
PCT No. PCT/CH80/00144, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01537, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 24, 1980, Ser. No. 285,099

Claims priority, application Switzerland, Nov. 26, 1979, 10491/79

Int. Cl.³ B60P *3/42*; B61D *3/16, 17/00*

U.S. Cl. 410—53 **5 Claims**



1. A convertible vehicle for railway and highway transportation, comprising a two part chassis, each part having a first end engageable with the other part first end to provide a single chassis for railway transportation and disengageable from one another to provide two separate trailers for highway transportation, chassis connecting means joining said first end of one part of said chassis to the first end of the other part at approximately the middle of said chassis, each said two parts including a coupling device adjacent said end having said connecting means, each said coupling device engageable with related coupling means of a highway tractor vehicle, said chassis connecting means permitting selective rigid connection of said two parts and the separation thereof from each other, said chassis connecting means including cooperating longitudinal alignment means on said two first ends, abutment means on the upper portion of each said chassis part first end, means projecting axially from each said part first end beneath said abutment means, said projecting means of one said first end laterally aligned with said projecting means of said other first end when said abutment means of said two first ends are in mutual contact, retainer means engageable with said laterally aligned projecting means, cooperating locking means carried by both said first ends operable to secured said two chassis parts with said abutment means engaged, each of said chassis parts having a second end, and mounting means near each said second end to permit the engagement and disengagement of railroad trucks and wheel sets for highway use therefrom.

4,405,272

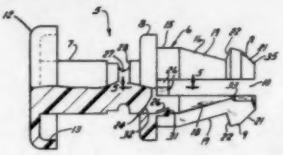
TWO-PIECE FASTENER WITH FRONT SHOULDER

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Mar. 11, 1981, Ser. No. 242,686

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—41 **4 Claims**



1. A fastener of the type comprising a sleeve-like body that is forwardly insertable into a round hole in a workpiece, said body having a laterally enlarged head at a rear end thereof and having longitudinal slots extending all the way to its front end from near said head to define forwardly projecting flexible legs which are disposed symmetrically to a longitudinal axis of the body, said fastener further comprising a plunger forwardly insertable into the body to an operative position, said plunger and said legs having cooperating camming surfaces whereby the legs are flexingly diverged by movement of the plunger to its operative position, said fastener being characterized by:

A. said plunger having a circumferential rearwardly facing shoulder which is near its front end but spaced behind the same and which is defined by a reduced diameter portion of the plunger;

B. said body having, in each of said slots, near the rear end thereof, a detent lug engageable with said shoulder to define a preliminary assembled position of the plunger in which the plunger leaves said legs undiverged, each of said detent lugs being formed in one piece with the body, projecting forwardly in its slot between adjacent legs and in detached relation to them, and being substantially shallow in the direction radial to said axis to be resiliently flexible in that direction independently of the legs, and each detent lug having

(1) an inner surface that is inclined forwardly and towards said axis and

(2) a forwardly facing surface which is engageable behind said shoulder and which meets said inner surface at an acute angle; and

C. each of said legs having near its front end a forwardly facing surface which is engageable against said shoulder when the plunger is in it operative position.

4,405,273

BLIND FASTENERS

John H. Ruhl, Tustin, and Richard D. Dixon, San Pedro, both of Calif., assignors to Huck Manufacturing Company, Irvine, Calif.

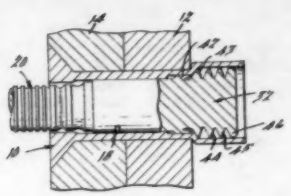
Continuation of Ser. No. 967,781, Dec. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,096, Jul. 19, 1977, abandoned. This application Nov. 7, 1980, Ser. No. 204,838

Int. Cl.³ F16B *13/08*

U.S. Cl. 411—43 **14 Claims**

1. A blind fastener of a selected metal for joining together a plurality of workpieces over a wide range of grips comprising a hollow tubular sleeve having a preformed head at one end and an open tubular extension at the other end, a pin including a shank disposed within said tubular sleeve having pull means formed thereon extending beyond the preformed head on the sleeve and having a solid blind head forming portion, extending beyond said other end of said sleeve, said blind head forming portion comprising a plurality of spaced annular ribs forming grooves therebetween constructed to engage and expand

said other end of said sleeve to form the blind head and to fold back successively in engagement with the inner wall of said other end as the fastener is set for different grips, said grooves having a root diameter less than the diameter of said pin shank



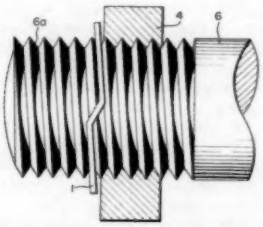
and the last following rib of the head forming portion is of the greatest strength and the first leading rib is of a strength more resistant to deflection than the remaining ribs intermediate said last following rib and said first leading rib.

4,405,274

SNAP RING INTENDED FOR PREVENTION OF LOOSENESS OF A NUT

Tatsuo Saitoh, Niisato, and Tsutomu Hasebe, Koganei, both of Japan, assignors to Toho Asechiren Kabushiki-kaisha, Tokyo, Japan

Continuation of Ser. No. 137,323, Apr. 4, 1980, abandoned. This application Jan. 27, 1982, Ser. No. 343,080
Claims priority, application Japan, Nov. 13, 1979, 54-156554
Int. Cl.³ F16B 21/18, 39/02
U.S. Cl. 411—249 9 Claims



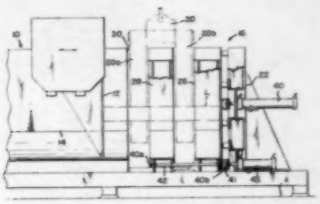
1. A snap ring adapted to be disposed on a threaded element adjacent to a threaded nut to prevent the threaded nut from coming off of the threaded element, said threaded element being of the type having alternate spiral crests and troughs, said snap ring comprising a twisted section such that the snap ring extends around portions of two adjacent troughs of the threaded element with said twisted section extending across the crest of the thread between said two troughs, said snap ring having a split enabling the snap ring to expand diametrically, said split being defined by two juxtaposed end portions on said ring, said split being annularly spaced from said twisted section so as to define an annular ring portion between said split and said twisted section, said snap ring being disposed on said threaded element with said split and said annular ring portion being disposed in the trough closest to said nut such that when the nut starts to unthread, said nut engages said two end portions of said ring juxtaposed to the split to force said two end portions to spread apart annularly and to move from said one trough closest to said nut to the next trough as said two end portions pass over the crest of the thread and settle in said next trough, whereby the snap ring prevents the nut from coming off of the threaded element.

4,405,275

UNLOADING APPARATUS FOR LOG BATCH FORMER

Ronald A. Makos, and James W. Young, both of Grays Harbor County, Wash., assignors to Enterprises International, Inc., Olympia, Wash.

Filed Jul. 31, 1981, Ser. No. 288,992
Int. Cl.³ B65G 57/02
U.S. Cl. 414—28 10 Claims



1. A batch former comprising:
a forming compartment for collecting a batch of logs, the compartment having an open end;
pusher means for pushing the batch of logs endwise through said open end out of said compartment;
unloading apparatus adjacent said open end for receiving said batch of logs, said unloading apparatus including:
(a) a movable receiver platen engageable by said logs, having a surface for supporting the logs, and being movable from a first position adjacent a log support member to a second position spaced from said member, and
(b) an intermediate log support member positionable between said compartment and said receiver platen, having a surface for supporting the logs, being movable from a first position adjacent said compartment between said receiver platen and said compartment to a second position spaced from both said compartment and said receiver platen by gaps; and
means for returning the log support member and receiver platen to their respective first positions,
wherein (1) the pusher means pushes the logs to engage the receiver platen so that initially only the platen moves away from the log support member as the logs move from the compartment, (2) the log support member moves away from the compartment after the platen has moved a predetermined distance and (3) the logs slide over the surface of the log support member when only the platen is moving.

4,405,276

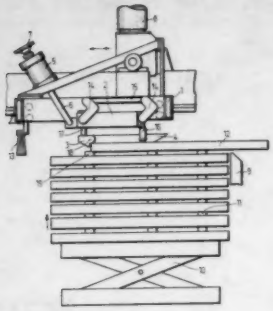
APPARATUS FOR UNSTACKING PLANKS

Karl-Wolfram Wiegand, Bochum, Fed. Rep. of Germany, assignor to Dimter GmbH Maschinenfabrik, Illertissen, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,205
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026613
Int. Cl.³ B65G 59/02
U.S. Cl. 414—119 5 Claims

1. An apparatus for unstacking planks from a stack comprising:
(a) a traverser truck;
(b) a lifting unit arranged on the traverser truck for supporting a stack of planks thereon;
(c) means for raising the top layer of the plank stack to a predetermined working level;
(d) cams operatively connected to said lifting unit, the cams being moveable over the entire length of the stack and moveable vertically relative to the lifting unit; and
(e) holding down devices resiliently supported on the lifting

unit and extending in the plank feed direction, the holding down devices being pivotally connected to corresponding



cams for movement relative to said cams and against the top layer of the plank stack.

4,405,277

UNLOADING RACK WITH ELEVATING DEVICE FOR A HEAT PRESS

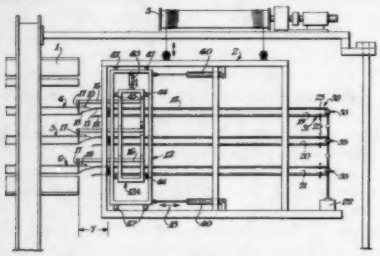
Wolfgang Bürkner, Darmstadt, and Gerhard Melzer, Lautertal, both of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 244,045

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013767

Int. Cl.³ B65H *29/00*; B29J *5/04*

U.S. Cl. 414—222 **1 Claim**



1. An unloading apparatus for a multi-level heat press that presses substantially flat elongated workpieces comprising an unloading rack having a workpiece removing device correlated with each level of the press, an elevator connected to the rack for moving it up and down, an unloading unit for each press level mounted in the unloading rack and including standard and auxiliary workpiece support levels, one workpiece removing device being constructed and arranged to cooperate with each unloading unit for removing workpieces from the press, means connected to activate the elevator to horizontally align the standard or auxiliary support level of each unloading unit with its associated press level, and unloading means associated with each unloading unit for drawing workpieces onto the standard and auxiliary support levels of each unit, the unloading means comprising a horizontally disposed chain conveyer constructed for movement in one direction and also in the reverse direction, a chain lug secured to the conveyer adapted to engage a workpiece after removal from the press by the workpiece removing device, and a reversible drive for the chain conveyer whereby horizontal alignment of the standard support level and its associated press level together with rotation of the chain conveyer in one direction causes the chain lug to draw a workpiece onto the standard support level while horizontal alignment of the auxiliary support level and that press level with rotation of the chain conveyer in the opposite direction causes the chain lug to draw a workpiece onto the auxiliary support level.

4,405,278

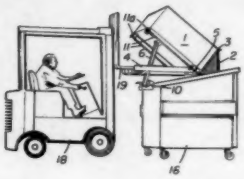
SELF-EMPTYING DUMP BOX

A. M. Kvalheim, 825 Petaluma Blvd. South, P.O. Drawer A, Petaluma, Calif. 94953

Filed Sep. 28, 1981, Ser. No. 306,293

Int. Cl.³ B66F *9/06*; B60P *1/04*, *1/64*

U.S. Cl. 414—411 **5 Claims**



1. A self-emptying dump box for trash and the like adapted for operation by a forklift truck comprising:

a container of generally rectangular configuration;

said container having a first pivot on one of its bottom ends mounted on a pallet;

said pallet being adapted to receive fork members of a forklift truck;

a hinged cover positioned over the end of said container adjacent to said first pivot;

a swinging leg member having its first end mounted on a second pivot on the bottom of said container at a point opposite said first pivot;

said leg member being disposed to rotate about said second pivot from a horizontal position parallel to the bottom of said container to a vertical position at right angles to said bottom;

support means of generally U-shaped configuration disposed to support the second end of said leg member at a predetermined location under said container when said member is in a substantially vertical position;

whereby said container may be made to rotate about said pivots when the elevation of said pallet is altered by the action of said forklift;

a first engageable catch means positioned on the second end of said leg member opposite said second pivot;

a second catch means positioned on the bottom end of said hinged cover opposite the bottom of said container;

each of said catch means being disposed to engage one another and hold said cover in a closed position and to disengage said cover and said leg means to an open position by the action of said forklift truck on said pallet;

thereby causing the contents of said container to empty through said cover.

4,405,279

TAILGATE LOADER

Robert F. Davy, and Wilhelm K. Kremp, both of Scarborough, Canada, assignors to Robert F. Davy, Scarborough, Canada

Filed Aug. 18, 1981, Ser. No. 293,842

Int. Cl.³ B60P *1/44*

U.S. Cl. 414—558 **9 Claims**

1. A tailgate loader for a vehicle, comprising:

upper arm means pivoted at one end to the rear of the vehicle at a first pivot location for swinging movement in a vertical plane,

lower arm means pivoted at one end to the rear of the vehicle at a second pivot location spaced below the first pivot

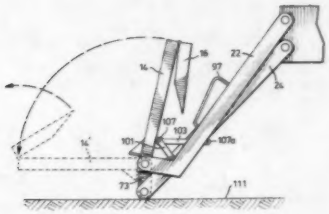
location, the lower arm means being mounted for swinging movement in a vertical plane,

a platform mounted for pivotal motion about the other end of the upper arm means, the platform being capable of swinging between a stored position in which it overlies the upper arm means and an extended position in which it projects rearwardly from the said other end of the upper arm means,

substantially vertical link means joining the other ends of the upper and lower arm means, thereby defining substantially a parallelogram mechanism,

power means for swinging the arm means about their pivot locations at the rear of the vehicle,

and an opener assembly for raising the platform from the stored position to a near-vertical position as the two arm



means swing downwardly about their pivot locations, the opener assembly including (a) a first connecting link pivoted at one end to the upper arm means at a location spaced a first distance from said other end thereof, (b) a second connecting link pivoted at one end to the lower arm means at a location spaced a second distance from the other end of the lower arm means, said second distance being greater than said first distance, the other ends of the first and second connecting links being pivotally connected together to form a knuckle,

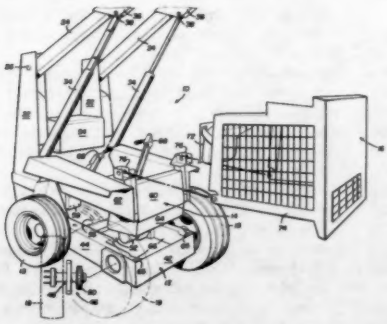
whereby as the arm means are lowered, the knuckle moves away from the upper arm means, thus pressing on and moving the platform toward a vertical position, so that the operator need not exert great force to swing the platform to its extended position.

4,405,280

MODULAR LOADER FRAME STRUCTURE

Gary L. Cochran; James E. Dawson, and Gary D. Stromberg, all of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Feb. 22, 1982, Ser. No. 351,067
Int. Cl.³ B66F 9/075
U.S. Cl. 414—685 **3 Claims**



1. A modular machine having a plurality of components which are structurally interconnected for convenient assembly, disassembly, servicing or repair, said modular machine comprising a base frame assembly, an operator's control station, and a cab assembly;

said base frame assembly including opposed end members and opposed side members forming an open frame construction with an engine mounted on one end thereof, said base frame side members including stepped inner walls for forming a cavity, vertical stanchions mounted to said base frame assembly and extending above said base frame assembly on opposite sides of said engine, lift arms pivotally mounted at one end to said stanchions and a material handling implement pivotally connected to the opposite end of said lift arms, at least one axle assembly mounted to each side member and a fluid motor mounted to each side member for driving said axle assembly;

said operator's control station including a front wall portion and rearwardly extending side wall portions, a frame extending downwardly from said front and side wall portions for engagement within the cavity formed by said base frame side members, said operator's control station being removably installed on said base frame assembly by abutting said control station side wall portions against said base frame side members and inserting said frame into said base frame cavity;

said cab assembly including an operator's seat attached to a box-like frame with said box-like frame being pivotally attached to said operator's control station for movement about a horizontal axis, said cab assembly being rotatable to a position permitting complete access into the interior of said operator's control station; and

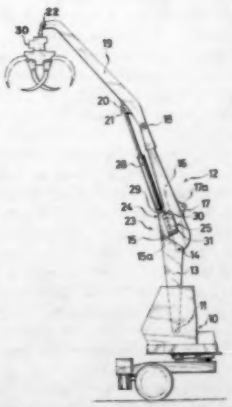
said base frame assembly, operator's control station, and cab assembly being removable from each other to permit complete access to all parts of said machine for easy servicing, repair or replacement.

4,405,281

HYDRAULIC EXCAVATOR WITH BOOM FOR LARGE RANGES OF ACTION AND LIFTING HEIGHTS

Heinz-Joachim Rüttershoff, Schwelm, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,424
Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920422
Int. Cl.³ E02F 3/38
U.S. Cl. 414—722 **4 Claims**



1. In a hydraulic excavator having a chassis a boom compris-

ing a boom lower part pivotally mounted to said chassis, and a boom upper part normally pivotally connected to the boom lower part, and having a stick pivotally connected to the boom upper part, the improvement for conversion of the excavator to operation using a gripper with large ranges of action and lifting heights, comprising

a connecting piece constituting means for rigidly connecting said boom upper part and said boom lower part, said connecting piece being connected to the boom upper part, said connecting piece is formed with an eye,

a hydraulic cylinder means for actuating said stick,

bolt means for swingably mounting said hydraulic cylinder means on said eye.

4,405,282

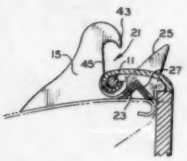
LOAD BEARING ARRANGEMENT FOR A MOVABLE BUCKET FORK LIFT ATTACHMENT

Jack D. Carter, 609 Curdes Ave., Fort Wayne, Ind. 46805

Filed Aug. 27, 1981, Ser. No. 297,038

Int. Cl.³ B66F 9/00

U.S. Cl. 414—724 **9 Claims**



1. An attachment for use with a movable bucket or the like having a plurality of substantially similar spaced retaining hooks, each of said hooks including a notch having an opening intermediate the ends thereof, and each of said hooks being fastenable to an upper portion of a movable bucket along a substantially horizontal line with the hook notch openings aligned; and support means fastenable to the upper portion of the movable bucket intermediate the retaining hooks, the attachment comprising:

(1) an elongated horizontal bar having a length greater than the distance between the outer ones of said spaced retaining hooks, said horizontal bar adapted to be easily picked up by said retaining hooks with the ends of said horizontal bar positioned outwardly of said outer spaced retaining hooks respectively;

(b) first and second fork lift elements mounted on said horizontal bar, each of said fork lift elements having a rigid, generally L-shaped configuration formed by a vertical portion and a horizontal portion, the upper end of said vertical portion being mounted on said horizontal bar and including a load bearing surface adjacent the horizontal bar for engaging the support means with the lower part of said vertical portion adapted to rest against the forward face of said bucket with the horizontal portion extending forwardly from said bucket with the end of said horizontal portion spaced from said bucket so that the weight of the fork lift elements and any load carried by those fork lift elements is carried primarily by the support means; and the support means comprising,

an elongated bar fastenable by welding to the outer surface of the upper portion of the movable bucket near the front edge thereof.

4,405,283

GAS TURBINE CONSTRUCTION AND METHOD OF CONTROLLING THE LABYRINTH SEAL CLEARANCE AUTOMATICALLY AND CONTINUOUSLY

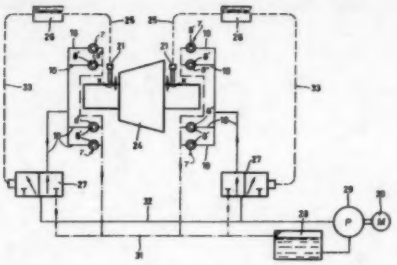
Edmund Owsianny, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nuraberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,379

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022861

Int. Cl.³ F01D 25/16, 25/28

U.S. Cl. 415—14 **6 Claims**



1. A hot gas turbine to be supported on a foundation, comprises:

a housing defining a rotor space;

a rotor rotatably mounted to said housing and in said rotor space, said rotor connected to a rotor shaft extending out of said rotor space from two opposite sides of said housing;

a rotor shaft bearing having a bearing block connected to said rotor shaft at each of said opposite sides of said housing and outside said rotor space, each bearing block adapted to be supported by the foundation;

a labyrinth seal connected between said rotor shaft and said housing at each opposite side of said housing, to which a pressure sealant is supplied for sealing said rotor space, each labyrinth seal having a clearance gap between said rotor shaft and said housing;

at least one traverse connected to said housing and extending to one of said bearing blocks on each opposite side of said housing;

a cushion cylinder connected to each traverse;

cushion support sleeve movable in each cylinder and each engaged on a bearing block, said sleeve and cylinder defining an annular cushion space therebetween; each cushion space being changeable in volume to adjust a distance between said traverse and an adjacent bearing block and thereby adjust said clearance gap on each side of said housing;

staybolt means connected to each bearing block and extending over each respective sleeve for limiting relative motion of each sleeve with respect to each traverse;

sensor means associated with said housing at each opposite side thereof for sensing an actual amount of each clearance gap;

fluid pressure means connected to each annular cushion space for selectively pressurizing and venting each cushion space; and

control means connected to each sensor means and to said fluid pressure means for controlling said fluid pressure means to change said actual clearance gap to a selected clearance gap, in response to a signal corresponding to the actual amount of each clearance gap from each sensor means.

4,405,284

CASING FOR A THERMAL TURBOMACHINE HAVING A HEAT-INSULATING LINER

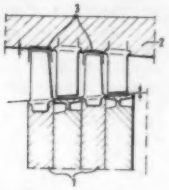
Günter Albrecht, Feldgeding; Albert Sickinger, Munich, and Hans-Jürgen Schmuhl, Würthsee, all of Fed. Rep. of Germany, assignors to MTU Motoren-Und-Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

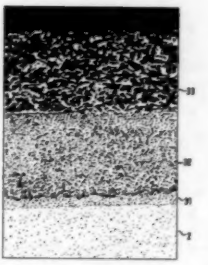
Filed May 14, 1981, Ser. No. 263,447

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018620

Int. Cl.³ B05D *1/08*

U.S. Cl. 415—174 14 Claims





1. A casing for a thermal turbomachine having a heat insulation liner, characterized by the liner being a multilayer formation comprising:

a metallic bond coat in direct contact with the casing wall,

a ceramic heat insulation layer bonded to the bond coat, and

an abradable coating in the form of a porous, predominantly metallic, top layer bonded to the ceramic layer.

4,405,285

DEVICE TO LOCK THE BLADES OF A TURBOBLOWER AND TO FASTEN THE FRONT COWL OF A TURBOJET ENGINE

Jean M. Surdi, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.-M.A.", Paris, France

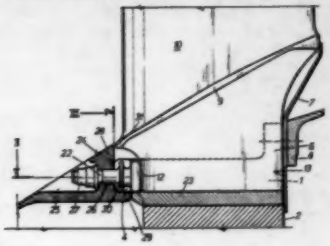
Filed Mar. 22, 1982, Ser. No. 360,882

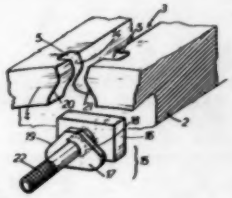
Claims priority, application France, Mar. 27, 1981, 81 06576

Int. Cl.³ F01D *5/32;* F04D *29/34*

U.S. Cl. 416—220 R 5 Claims

1. In a locking device for the blades of a fan and for fastening the forward cowl of a turbojet engine, the roots of said blades being maintained in axial grooves with a dovetail configuration on the rim of a rotor disk by means of wedges placed between the blade root and the bottom of the groove, with teeth formed in the axial upstream extension of the rim comprising opposed radial slots, the improvement comprising: a fastening piece (15) consisting of three parts: a first parallelepipedic part (16) engaging the radial slots (5) of the teeth (4) of the rims, a second prismatic part (17) the convergent faces (18, 19) whereof define an angle at the apex equal to that of the sides (20, 21) of the dovetail of the axial grooves (3) extending into the teeth and against which it radially abuts, and a third cylindrical part (22) threaded at least in part to receive fastening means (27) for the forward cowl (24), the first and the second parts (16, 17) being





parallel to each other and perpendicular to the axis of the third part (22).

4,405,286

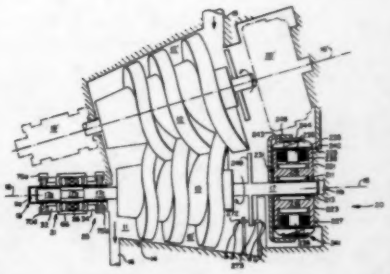
ACTIVELY SUSPENDED COUNTER-ROTATING MACHINE

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1982, Ser. No. 341,383

Int. Cl.³ F16C *35/00;* F04B *49/06, 49/00;* F04C *2/16*

U.S. Cl. 417—1 15 Claims



1. An actively suspended counter-rotating machine, comprising:

a plurality of shafts (17,17');

an equal plurality of means (10,12) mounted on said shafts in close, non-contacting fit for subjecting intermediate substances to axial and radial compression during counter-rotation of said shafts;

an equal plurality of means (19,19') coaxially disposed around one end of said shafts for generating in adjoining

sectional lengths (17*a*, 17*c*) of said shafts a first plurality of opposed, magnetic flux paths (22, 24) radially penetrating and axially traversing said sectional lengths;

a plurality of means (211–214, 216–219) symmetrically arrayed around the other end of said shafts for radiating a second plurality of opposed magnetic flux paths (22/24) each traversing central magnetic flux path segments lying within planes passing along the longitudinal axes (18,18') through said shafts;

an equal plurality of means (237, 238) each coaxially disposed in proximity to said radiating means around said shaft ends for each creating torque about longitudinal axes when energized by electrical currents flowing orthogonally to said central magnetic flux path segments;

an equal plurality of discrete means (248, 248') affixed to said different shafts ends in conjugate proximity to said central magnetic flux path for converting said torque into counter-rotation of said shafts; and

means (250) responsive to the angular rotation of said shafts for synchronizing the energization of said plurality of torque creating means (237,238).

4,405,287

REGULATING DEVICES FOR A PLURALITY OF PUMPS DRIVEN BY A COMMON SOURCE

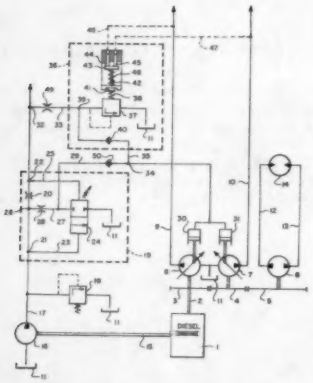
Dietrich Kuchenbecker, Aschaffenburg, and Erich Eckhardt, Grossumstadt, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,704

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024399

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—216 8 Claims



1. In a regulating device for an aggregate of several pumps driven by a common primary-energy source, at least one of which pumps is adjustable relative to its output volume per revolution, and with an auxiliary control pressure pump constant with respect to output volume per revolution and driven by the same primary-energy source, in the delivery line of which a restrictor is located, a hydraulically regulated discharge valve having at least one control pressure chamber in which case the pressure gradient in front of and beyond this restrictor acts on the at least one control pressure chambers of said hydraulically regulated discharge valve, which discharge valve is incorporated in a drain line connected to the delivery line of the auxiliary control pressure pump, the improvement wherein the drain line is connected in front of the restrictor in the direction of flow to the delivery line from the auxiliary control pressure pump, adjusting means connected to each adjustable pump and a control pressure line, to which all the adjusting means connected to each adjustable pump are connected, branching off from the said drain line in front of the discharge valve.

4,405,288

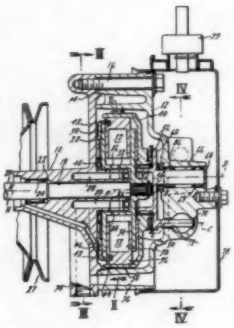
VARIABLE DISPLACEMENT HYDRAULIC PUMP AND CONTROLS THEREFOR

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1980, Ser. No. 126,924

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—220 5 Claims



1. A hydraulic fluid pump for producing a constant flow rate comprising:

a rotor mounted for rotation about a first axis having multiple cylinders circumferentially spaced around and radially directed from the first axis and a piston slidably working in each cylinder;

means defining a first space extending over a first angular portion of the rotor, communicating a source of fluid with the cylinders and defining a second space extending over a second angular portion of the rotor communicating the cylinders with a passage that carries fluid from the cylinders;

an eccentric pivotably mounted on a second axis eccentric of the first axis providing a support hub having an arcuately movable actuator pin spaced radially from the second axis for pivoting the support hub into and out of alignment with the first axis;

a pumping ring having a guide surface with which the pistons maintain contact during rotation of the rotor, rotatably supported on the hub of the eccentric whereby the axis of the pumping ring pivots about the second axis into and out of alignment with the first axis as the eccentric pivots;

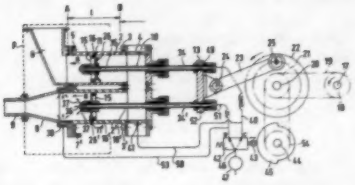
control piston means operative in response to the application of control pressure to a first control piston to pivot the actuator pin about the second axis and thereby to increase the eccentricity between the axis of the pumping ring and the first axis thus increasing the flow rate of the pump and operative in response to the application of control pressure to a second control to pivot the actuator pin about the second axis and thereby to decrease said eccentricity thus decreasing the flow rate; and

means operative in response to a differential fluid pressure corresponding to a predetermined pump flow rate for directing control pressure to one or the other of said control pistons.

4,405,289
APPARATUS FOR PUMPING A POWDERY OR GRANULAR MATERIAL

Shigeo Nakashima, No. 7-7, Tanjianomori, Morimoto-cho, Muko, Kyoto, Japan

Filed Aug. 14, 1981, Ser. No. 292,925
Claims priority, application Japan, Aug. 31, 1980, 55-121429
Int. Cl.³ F04B 3/00
U.S. Cl. 417—250 7 Claims



1. An apparatus for pumping a powdery or granular material, which comprises:

a first cylinder having a material inlet means at the front end and a second cylinder having a material outlet means at the front end, said first and second cylinders being parallel to each other;

a connector box connecting the rear ends of said cylinders for placing them in communication;

first and second pistons in said first and second cylinders, respectively, and having first and second piston rods connected to the respective first and second pistons and extending rearward from the pistons out of the cylinders;

means connected to said first and second piston rods for reciprocating said first and second pistons simultaneously in the same directions within the respective first and second cylinders;

said first and second pistons each having openings therethrough and the opening of said first piston being provided with a one-way valve which is normally closed and which is opened when said first piston is moving in the forward direction, and the opening of said second piston being provided with a one-way valve which is normally closed and which is opened when said second piston is moving in the rearward direction, one of said first and second piston rods being hollow and having at least one opening therein on the side of the piston on said one piston toward which that piston moves with the one-way valve thereon closed; and

a compressed air supply means connected to the hollow interior of said one piston rod.

4,405,290
PNEUMATIC SUPPLY SYSTEM HAVING VARIABLE GEOMETRY COMPRESSOR

George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 24, 1980, Ser. No. 210,071
Int. Cl.³ F04B 27/02
U.S. Cl. 417—282 5 Claims

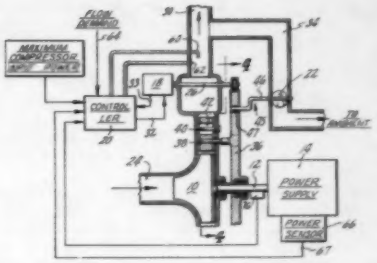
1. A pneumatic supply system characterized by:

a compressor including a variable geometry stator portion included in an outlet portion of said compressor, for providing delivery by said compressor of an airflow of varying magnitude in accordance with demands of a load;

actuator means for operating said variable geometry stator portion;

a dump valve disposed in fluid communication with said compressor outlet and sequentially operated with said variable geometry stator portion by said actuator means; and

control means responsive to the flow demand of said load, the flow output of said compressor, the power input and maximum allowable power input to said compressor and the position of said variable geometry stator portion for controlling said actuator means, thereby controlling the

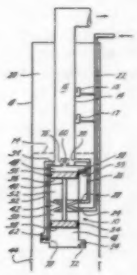


actuation of said variable geometry stator portion and said dump valve.

4,405,291
DOWNHOLE DOUBLE ACTING PUMP

Carlos R. Canalizo, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 152,529, May 22, 1980, abandoned.
This application Jan. 7, 1983, Ser. No. 456,366
Int. Cl.³ F04B 47/08
U.S. Cl. 417—393 5 Claims



1. A downhole double-acting pump comprising

a tubular housing,

a valve body positioned in the intermediate portion of said tubular housing providing upper and lower body chambers within said housing,

a piston positioned within each of said body chambers providing a pump chamber and a power chamber,

means connecting the pistons,

a power fluid inlet to the valve body,

check valve means associated with said pump chambers to control movement of well fluids therethrough,

said valve body having a closed main cylinder therein,

a main valve member reciprocal in said cylinder and having an intermediate and first and second endwise seals,

a fluid inlet port into said main cylinder in fluid communication with the power fluid inlet positioned such that as the main valve member reciprocates the intermediate seal passes said inlet port,

first and second outlet ports in said main valve cylinder on opposite sides of said inlet port,

passageways respectively connecting said upper and lower power chambers with said cylinder at points intermediate the inlet and outlet ports,

said first and second endwise seals alternately connecting

said passageways with said inlet port and one of said outlet ports,

a pilot valve cylinder extending through said valve body and having an inlet in fluid communication with the power fluid inlet and outlets straddling said inlet,

passageways extending respectively between each end of said main valve cylinder and the pilot valve cylinder intermediate the inlet and each outlet port of the pilot valve cylinder,

a reciprocal pilot valve member in said pilot valve cylinder having an intermedate and first and second endwise resilient seals thereon,

said pilot valve member in said pilot valve cylinder having an intermediate and first and second endwise resilient seals thereon,

said pilot valve intermediate seal passing over the pilot valve inlet port with reciprocation of said pilot valve between first and second positions,

said pilot valve intermediate and endwise seals alternately connecting said pilot valve inlet and outlets with respective ones of said passageways between the main and pilot valves, and

resilient means carried by each of said pistons and engageable with said pilot valve as each piston approaches said valve body,

at least one of said seals on said pilot valve member subject to the differential between the pilot valve inlet and a pilot valve outlet with the pilot valve in each of its first and second positions,

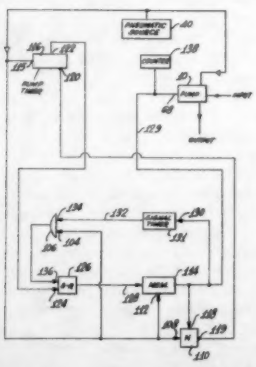
said differential expanding said seal into engagement with said pilot valve cylinder and providing breakaway frictional engagement with the cylinder resisting movement of the pilot valve member from its at rest position when engaged by said resilient means until the resilient means exerts a greater force than the differential exerted by pressure in the two power chambers on the pilot valve member and the breakaway friction of said pilot valve seals and when the breakaway friction is overcome the pilot valve may be moved between its first and second positions by said resilient means with a snap action.

4,405,292

PNEUMATICALLY CONTROLLED RATE PUMP

Willard W. Bixby, Jr., LaCanada, Calif., and Jerry Christopher, Houston, Tex., assignors to Haskel, Incorporated, Burbank, Calif.

Filed Nov. 9, 1981, Ser. No. 319,716
Int. Cl.³ F04B 17/00
U.S. Cl. 417—403 **17 Claims**



2. A pneumatic pumping apparatus having a pumping chamber, inlet and outlet valves associated with said pumping chamber, a piston reciprocable within said pumping chamber to pump a fluid into and out of said pumping chamber, an actuation chamber, an actuation piston reciprocable within said actuation chamber and connected to said pumping piston for movement therewith, a primary inlet for admitting a pressurized gas to operate said actuation piston, pneumatic cycling means for causing said actuation piston to commence a new cycle of movement within said actuation chamber upon the application thereto of a pilot signal, and a pneumatic source connected to said primary inlet to supply said pressurized gas thereto, wherein the improvement comprises:

pneumatically operated pump timer means supplied by said pneumatic source for measuring predetermined pumping intervals and for initiating said pilot signal at the beginning of each of said intervals; and

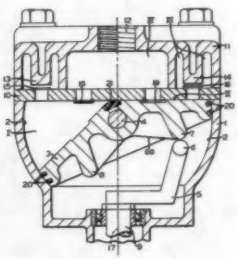
pneumatically operated means for resetting said pump timer means at the conclusion of each of said pumping intervals.

4,405,293

COMPRESSOR

Wilhelm Pape, Wunstorf, Fed. Rep. of Germany, assignor to Wabco Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,448
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945116
The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.
Int. Cl.³ F04C 21/00
U.S. Cl. 417—482 **3 Claims**



1. An oscillating piston compressor comprising:

(a) a housing having a substantially semi-spherical piston chamber characterized by a seamless surface,

(b) a disk-shaped piston comprising a pair of semi-circular sectors joined in angular relation to each other and oscillatingly disposed in said piston chamber on a bearing axle journaled in the housing in axial coincidence with the greatest diameter thereof and with the line of juncture of said pair of semi-circular sectors, the geometric centerpoint of said spherical chamber coinciding with the midpoint of the axis of said axle,

(c) sealing means disposed peripherally on said piston for making sealing contact with said seamless surface during oscillating movement of the piston,

(d) a circular flat valve plate fixed transversely in said housing so as to separate said piston chamber adjacent one side thereof from an air supply chamber and a pressure delivery chamber adjacent the opposite side thereof, said one side axially spaced from such geometric centerpoint of said spherical chamber,

(e) said piston chamber having formed therein a pair of compression chambers sealingly isolated from each other and defined by said valve plate, said housing, and said piston sectors on opposite sides of said bearing axle, respectively,

(f) each of said compression chambers being alternately communicated with said supply chamber and delivery chamber, via respective intake and delivery valves opera-

bly disposed in said valve plate, by oscillatory movement, and

(g) driving means for imparting oscillatory movement to said piston, wherein said driving means is diposed within said housing and said driving means further comprises a cylindrical undulated cam surface formed on the side of said piston opposite said compression chambers, a crankarm having a follower in rolling contact with said cam surface, and a rotatable drive-shaft carrying said crankarm for imparting rotating motion thereto on said cam surface.

4,405,294

DOSING PUMP

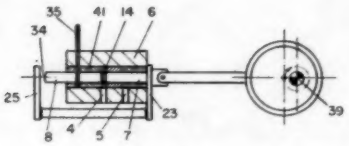
Scato Albarda, Gross Schenkenberg, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,976

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038525

Int. Cl.³ F04B *19/00, 19/22*

U.S. Cl. 417—488 **10 Claims**



1. A pump, comprising:

a housing having a bore therein;

a plurality of wear-resistant rings pressed into said housing bore and spaced from each other defining a common piston bore;

a first piston slidable in said common piston bore;

a second piston slidable in said common piston bore next to said first piston;

said housing having means defining an inlet and outlet communicating with said housing bore, said plurality of rings spaced from each other to form an inlet space communicating with said inlet and an outlet space communicating with said outlet;

control means connected to said first piston for moving said first piston through a pumping stroke from said inlet space to the vicinity of said outlet space, said control means engaging with said second piston to move said second piston in the same direction as movement of said first piston through a portion of said stroke, a maximum clearance between said first and second pistons in said piston bore comprising a stroke volume;

two of said plurality of wear-resistant rings define one additional space; and

a brake spring extending through said one additional space and engaging said second piston for braking the movement of said second piston.

4,405,295

METHOD OF MANUFACTURING COMPLEX METALLIC PLATE

Tetsuya Fujii; Yukio Oguchi; Norio Sumita, all of Chiba, and Isamu Goto, Kobe, all of Japan, assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 1, 1982, Ser. No. 353,400

Int. Cl.³ B22F *7/02*

U.S. Cl. 419—28 **4 Claims**

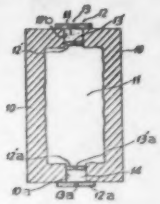
1. A method of producing complex metallic plate comprising the steps of

pressure injecting an iron base molten metal into a mold through an injection hole in the botom of the mold,

after the metal has reached predetermined height, allowing the metal to partially solidify by maintaining a near constant pressure,

after a predetermined thickness of metal has solidified, reducing the pressure in the mold to allow unsolidified metal to run out and thusly form a hollow metal piece,

injecting an inactive gas into the hollow metal piece,



filling the hollow metal piece with a metal powder mixture to form a filled metal piece, sealing each of the top and bottom openings in the hollow metal piece with two plates of a metal similar to the molten metal and each having at least one ventilation hole with a carbon base powder between said two plates,

sintering said filled metal piece and rolling said heated filled metal piece to form a complex metallic plate.

4,405,296

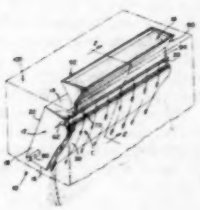
METALLIC PARTICLE GENERATION DEVICE

Earl N. Stuck, Wareham; Keith D. Pigney, Taunton, and Howard Gifford, Westport, all of Mass., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 300,224, Sep. 8, 1981, Pat. No. 4,374,789. This application Sep. 29, 1982, Ser. No. 427,900

Int. Cl.³ B22D *11/01*

U.S. Cl. 425—6 **5 Claims**



1. A device for producing metallic particles comprising:

means defining a Coanda surface;

means for flowing a first fluid along said Coanda surface;

a second fluid located adjacent said Coanda surface to be influenced by the flow of said first fluid toward an intersection with said first fluid;

means for introducing a flow of molten metal between said first and second fluids, said molten metal being introduced between said fluids, the entrainment of said molten metal postponing but not preventing intersection of said fluids;

intersection between said first and second fluids occurring at a location spaced from the location of molten metal introduction between said fluids, where said flow of molten metal is broken up so that metallic particles can be formed.

4,405,297

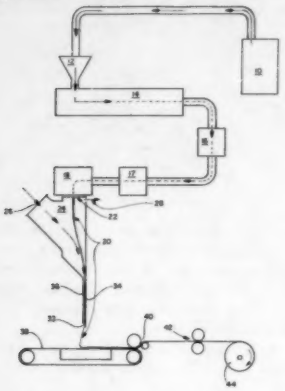
APPARATUS FOR FORMING NONWOVEN WEBS

David W. Appel, Wittenburg, and Michael T. Morman, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 146,450, May 5, 1980, Pat. No. 4,340,563. This application May 3, 1982, Ser. No. 373,823

Int. Cl.³ D01D 5/08

U.S. Cl. 425—72 S 9 Claims



1. Apparatus for forming a nonwoven web from a fluid material comprising,

(a) a spinnerette having a capillary array forming one or more rows of closely spaced filaments from said fluid material;

(b) a low pressure quench chamber having means for receiving said filaments and an opening substantially across the machine width with dimensions and a configuration to avoid substantial contact between said filaments and the surface of said quench chamber and a volume sufficient to allow solidification of said filaments within said quench chamber;

(c) a source of low pressure quench fluid at a temperature cooler than said filaments;

(d) an inlet in said quench chamber for introducing said quench fluid on one side of said filaments and directing said fluid into said filaments to cause cooling of the filaments;

(e) a nozzle having an entrance for receiving said cooled filaments and an opening substantially across the machine width and in cooperative engagement with said quench chamber to receive said cooled filaments and quench fluid and having dimensions to produce cooling fluid velocity in the range of from about 150 to 800 feet per second to draw said filaments; and

(f) means for collecting said filaments as a web of entangled filaments.

4,405,298

MASA SHEETING APPARATUS

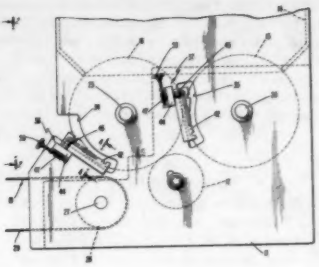
William A. Blain, Spring Valley, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Apr. 19, 1982, Ser. No. 369,509

Int. Cl.³ A21C 3/02, 3/10, 9/00

U.S. Cl. 425—308 14 Claims

1. In masa sheeting apparatus comprising a hopper for receiving masa, first and second driven rollers positioned beneath said hopper in closely spaced relationship to form a masa sheet, means for separating said masa sheet from said first roller, a cutting member acting against said second roller for cutting said masa sheet, a take-away conveyor, and a tensioned wire extending along the surface of said second roller above said second roller, the improvement comprising said second tensioned wire being a flat band having a width and a thickness, the widthwise surface thereof being held flat against the surface of said second roller.



4,405,299

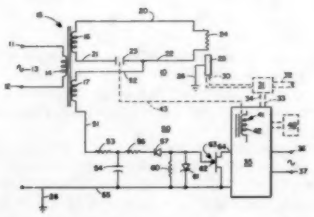
BURNER IGNITION AND FLAME MONITORING SYSTEM

Stephen L. Serber, New Hope, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 24, 1981, Ser. No. 286,500

Int. Cl.³ F23N 5/00

U.S. Cl. 431—78 10 Claims



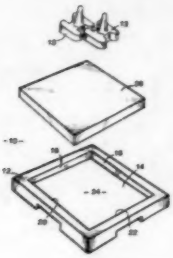
1. A burner ignition and flame monitoring system adapted to control a fuel burner in response to a condition responsive means, including: hot surface ignitor means adapted to be mounted in proximity to said fuel burner to ignite fuel issuing from said fuel burner; first power source means connected to said hot surface ignitor means in series circuit with an ignitor control switch to controllably energize said ignitor means to generate an ignition temperature at said ignitor means; flame sensing circuit means adapted to be connected to and operatively energized from alternating current power source means concurrently with the energization of said hot surface igniter means; said ignitor means being connected to said flame sensing circuit means with said flame sensing circuit means being responsive to the presence or absence of flame between said ignitor means and said burner by said flame effectively rectifying said alternating current power source means; primary control means connected to said flame sensing circuit means and being responsive to the presence or absence of said flame at said burner; and switch control means operated by said primary control means to in turn operate said ignitor control switch to deenergize said hot surface igniter means when flame is sensed.

4,405,300

FURNACE TRAY WITH CARBON PLATE

Jack Lubowsky, and Ronald Berger, both of East Brunswick, N.J., assignors to Tri-Dynamics Dental Co., Inc., East Brunswick, N.J.

Filed Feb. 27, 1981, Ser. No. 238,976
Int. Cl.³ F24D 23/02; F27B 5/04; F27D 5/00
U.S. Cl. 432—2 7 Claims



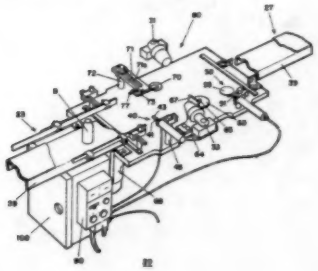
5. A method for firing false teeth comprising:
supporting false teeth to be fired on the upper surface of a carbon plate in a furnace; and
firing said teeth while the same are supported by said carbon plate and thereby simultaneously purging the interior of the furnace with the carbon.

4,405,301

BOTTLE TURNER

Robert M. Jodrey, Westboro, and Warren R. Pitts, Needham, both of Mass., assignors to Dennison Manufacturing Company, Farmingham, Mass.

Filed Nov. 9, 1981, Ser. No. 319,569
Int. Cl.³ F27B 9/14; C03B 23/00; B65G 47/12; F24J 3/00
U.S. Cl. 432—124 20 Claims



1. Apparatus for heating bottles and the like comprising:
continuously moving conveyor means for frictionally engaging bottles and urging them along a transport path;
a first gate comprising a first stop member for arresting the progress of bottles frictionally engaged by said conveyor means, and means for extending and retracting said first stop member respectively into and out of the transport path of said bottles;
a second gate, comprising a second stop member for arresting the progress of bottles frictionally engaged by said conveyor means while permitting their rotation, and means for extending and retracting said second stop member respectively into and out of the transport path of said bottles;
means for turning any bottle arrested by said second gate; and
means for heating any bottle arrested by said second gate.

4,405,302

SUPPORT FOR MOUNTING METAL MIRROR ON TEETH

Cheri J. Lewis, 240 S. La Cienega Blvd., Beverly Hills, Calif. 90211

Continuation-in-part of Ser. No. 253,796, Apr. 13, 1981, Pat. No. 4,354,835. This application Jun. 28, 1982, Ser. No. 392,528
Int. Cl.³ A61B 1/24
U.S. Cl. 433—30 2 Claims

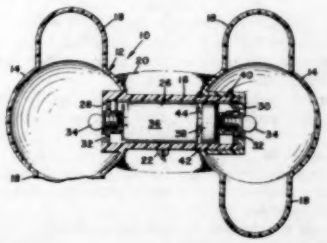
1. A support for a dental mirror capable of being mounted onto a spring clip, said support comprising:
a cylindrical body having a first cylindrical section of a first diameter and a second cylindrical section of a second diameter which is smaller than said first diameter;
a hook end disposed on said second section opposite said first section with a coil spring disposed between the hook end and against the first cylindrical section, a cup having an axially aperture and said cup is disposed between said spring and said hook, said cup being urged by the spring against the spring clip when the hook is mounted to engage the spring clip;
a link slideably mounted on said first cylindrical section;
said link having a socket formed at one end;
said mirror being and having a radially protruding ball formed thereon;
said ball being disposed within said socket in swivel relationship therein.

4,405,303

PORTABLE RECREATIONAL MARKER BUOY

Richard K. Smith, 7066 Carey La., Maple Grove, Minn. 55369

Filed Aug. 28, 1981, Ser. No. 297,134
Int. Cl.³ B63B 21/52
U.S. Cl. 441—16 9 Claims



1. A portable recreational marker buoy, comprising:
an elongate substantially symmetrical float body including a pair of spaced-apart hollow spherical end portions interconnected by a reduced intermediate tubular portion, one of the end portions being threaded onto the intermediate portion of said body;
a seal disposed between ajoining surfaces of the removable end portion and the intermediate portion of said body;

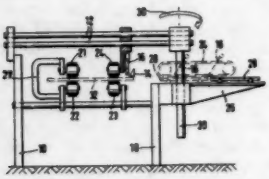
a pair of laterally extending paddles secured to each end portion of said body, said paddles being substantially coplanar;
a flexible line having two ends, said line being helically wound around and secured at one end to the intermediate portion of said body;
a sinker secured to the other end of said line, said sinker being of sufficient weight to rotate said body and paddles thereon in water to unreel said line until said sinker hits bottom;
a pair of bulbs located at opposite ends of the intermediate portion and extending into the end portions of said body;
a battery housed within the intermediate portion of said body; and
circuit means for selectively connecting said battery and bulbs to illuminate the buoy.

4,405,304

ADJUSTABLE CARTON FOLDING MACHINE

Wolfgang Bensberg, Düsseldorf, and Hartmut Klapp, Kaarst, both of Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,432
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021442
Int. Cl.³ B31B *1/74*
U.S. Cl. 493—476 **8 Claims**



1. A folding-carton gluing machine comprising a machine frame, conveying means for the flat carton blanks, a crossbeam on the frame, carton working tools slidably mounted on the crossbeam, means for adjusting the position of the tools relative to a blank, the tools being movable from a working position which they are to occupy in the machine into a position in which they are spaced from the working position, and a sliding table for holding a flat carton blank and moving said blank under the tools when the latter are spaced from their working position to enable manual adjustment of said tools.

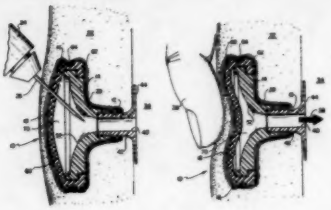
4,405,305

SUBCUTANEOUS PERITONEAL INJECTION CATHETER

Robert L. Stephen; Carl Kablitz; Barry K. Hanover; Stephen C. Jacobsen, and Jeffrey J. Harrow, all of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 200,830, Oct. 27, 1980. This application Feb. 17, 1981, Ser. No. 235,185
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—49 **33 Claims**

18. A method for injecting a drug into a peritoneal cavity in a direction toward the mesenteric peritoneal membrane, the method comprising the steps of:
obtaining an injection conduit, comprising:
a shallow vessel with an open top; a penetrable membrane covering the open top of the vessel;
a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the vessel such that the stem forms a passageway extending from the vessel; and
a diametrally enlarged flange attached to the stem such that, when the conduit is implanted underneath a layer of skin adjacent the peritoneal cavity and the flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is directed toward the mesenteric peritoneal membrane;
implanting the injection conduit underneath a layer of skin adjacent the peritoneal cavity with the membrane being generally parallel to the skin, the hollow stem penetrating the parietal peritoneal membrane and extending into the peritoneal cavity, the diametrally enlarged flange being secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem being directed toward the



mesenteric peritoneal membrane, and the passageway communicating between the vessel and the peritoneal cavity; and
injecting a drug into the peritoneal cavity by penetrating the layer of skin and the penetrable membrane with a hollow needle and forcing the drug through the hollow needle into the vessel with the hollow stem carrying the drug into the peritoneal cavity in a direction toward the mesenteric peritoneal membrane.

4,405,306

MEDICATED DISPOSABLE DOUCHE PRODUCT

Robert W. Pritchard, Pittsburgh, Pa.; Edward J. Drozd, Lake Hiawatha, and Michael K. Lutz, Watchung, both of N.J., assignors to Beecham Inc., Clifton, N.J.

Filed Dec. 8, 1981, Ser. No. 328,734
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—87 **9 Claims**

1. A douche product, which comprises:
a. an elongated reservoir means having an open end and a closed end, a liquid in said reservoir means, said closed end having port means for permitting the flow of liquid into and out of said reservoir means, a cover means removably mounted in and sealing said open end, and first and second flange means for said cover means and said reservoir means, respectively;
b. a bottle having an elongated head with an opening in said head for permitting the flow of liquid into and out of said

bottle, a douching liquid in said bottle, said reservoir means being removably and sealingly mounted in said opening in a normally closed position with said closed end inside said bottle and said cover means outside said bottle, said reservoir means being movable from said closed position to an open position, sealing means engaging said reservoir means when said reservoir means is in said closed position for preventing flow of liquid between said bottle and said reservoir means via said port means;

c. tubular nozzle means threadedly engaging said head and operable to be advanced towards or away from said bottle by rotation of said nozzle means about said head in a first or second direction, respectively, said nozzle means having aperture means therein for permitting liquid to be dispensed from said bottle through said nozzle means; and

d. operating means associated with said nozzle means operable when said nozzle means is moved in a predetermined direction relative to said head to move said reservoir means from said closed position to said open position and to remove said cover means from said reservoir means, said operating means comprising (i) securing means for securing said first flange means to said nozzle means, whereby said cover means and nozzle means move as a unit when said nozzle means is rotated, and (ii) flange-engaging means on said nozzle means for engaging said second flange means after said nozzle means has been rotated through a predetermined rotation in said second direction and then moving said reservoir from said closed position to said open position upon further rotation of said nozzle means in said second direction, said sealing means being disengaged from said reservoir means when said reservoir means is in said open position, whereby said liquid in said reservoir means drains into said bottle through said port means, and said reservoir means and cover means being operable when said reservoir means is in said open position and said cover means is removed therefrom to permit dispensing of the contents of said bottle through said nozzle means.

4,405,307

NEEDLE ASSEMBLY AND METHOD FOR FABRICATING SAME

Alan N. Taylor, 2131 Martindale, SW., Wyoming, Mich. 49509

Filed Dec. 10, 1981, Ser. No. 329,200
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—165 **33 Claims**

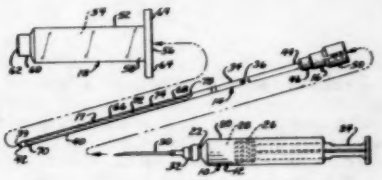
1. A method for fabricating a needle assembly comprising an outer cannula, an inner stylet, an orienting hub on the proximal end of the cannula and a mating locating cap on the proximal end of the stylet, said method comprising the steps of: fixing a plug of plastic material on the proximal end of the stylet; inserting the distal end of the stylet into the proximal end of the cannula having a hub with locating means at the proximal end of the cannula; aligning the distal end of the stylet longitudinally and rotationally with the distal end of the cannula; placing a locating cap having a throughbore over the plastic plug on the proximal end of the stylet inserted into the cannula and aligned at the outer end thereof with the stylet; positioning locating means on the cap in mating relationship with the locating means on the hub; and inserting solvent into the outer end of the bore in the cap to solvent bond the cap to the plug on the stylet with the cap and hub, and stylet and cannula in proper alignment with each other.

4,405,308

ANESTHESIA DEVICE WITH SELECTIVE SPRAY PORTS

James L. Jessup, Elk Grove Village, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 23, 1981, Ser. No. 334,029
Int. Cl.³ A61M *11/00, 25/00*
U.S. Cl. 604—200 **4 Claims**



1. An anesthesia device, comprising:

a syringe having a chamber, and means for pumping fluid from the chamber;

an elongated cannula attached to the syringe, said cannula having a lumen in communication with the chamber of the syringe, a plurality of apertures in a distal portion of the cannula communicating with the lumen, and an opening adjacent a distal end of the cannula and distal said apertures, said opening communicating with the lumen; and

means for releasably closing the apertures in the distal portion of the cannula while leaving said opening unobstructed, and for frictionally engaging the cannula to prevent dislodgment during use of the cannula, wherein the closing means comprises an elongated sleeve of flexible material snugly received on the distal portion of the cannula over said apertures, wherein the sleeve has a tear strip extending longitudinally along the sleeve to sever the sleeve.

4,405,309

SURGICAL DRAINAGE DEVICE WITH METERED AIR PUMP

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Apr. 21, 1981, Ser. No. 256,152
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—317 **12 Claims**

1. A metered air pump for relieving excess negativity in an inlet tube of a surgical underwater drainage device comprising:

a surgical underwater drainage device having an inlet tube;

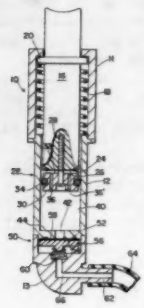
an elongate hollow body having an upper end and a lower hose fitting;

an elongate plunger means mounted for reciprocal movement in said body, said plunger means being resiliently urged toward the upper end of said body so that in a rest position a portion of said plunger means extends beyond the upper end of said body;

a metered air chamber located in said body below said plunger means;

a pump air inlet which provides fluid communication between the open atmosphere and said metered air chamber;

a pump air outlet at the bottom of said body which provides fluid communication between said metered air chamber and said lower hose fitting;



means to seal said pump air inlet fluidly from said metered air chamber when said plunger means is depressed;

means to seal said pump air outlet fluidly from said metered air chamber when said plunger means is undepressed; and

means to connect said hose fitting fluidly with the inlet tube;

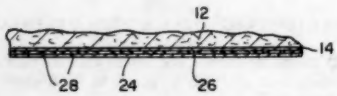
such that when excess negativity is present in the inlet tube, said plunger means causes a metered amount of air to be injected into the inlet tube to relieve the excess negativity.

4,405,310

SANITARY NAPKIN ASSEMBLY

Hamzeh Karami, Tilff, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,383
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—383 **3 Claims**



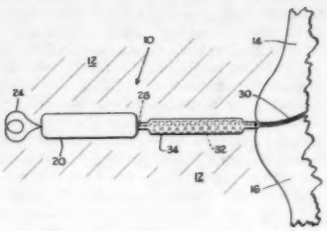
1. A sanitary napkin assembly comprising an absorbent pad, means secured to said absorbent pad for attaching the sanitary napkin assembly to a waistband, mounting means comprising a first thin sheet having a plurality of spaced openings therein, adhesive means coated on both sides of said first sheet, said adhesive means on one side of said first sheet fixedly attaching said first sheet to said absorbent pad, a second thin sheet of an imperforate waterproof material removably secured to said first sheet by said adhesive means on the other side of said thin sheet so that when said second sheet is peeled from said first sheet, an absorbent pad can be adhesively secured below said first recited absorbent pad.

4,405,311

METHOD AND APPARATUS FOR DIRECT ELECTRICAL INJECTION OF GOLD IONS INTO TISSUE SUCH AS BONE

Wilson Greatbatch, Clarence, N.Y., assignor to Greatbatch Enterprises, Inc., Clarence, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,118
Int. Cl.³ A61N *1/30*
U.S. Cl. 604—20 **12 Claims**



1. A method for treating rheumatoid arthritis by direct injection of electrically generated gold ions into the joint.

7. Apparatus for treating rheumatoid arthritis comprising:

(a) a source of constant direct electric current;

(b) a treating electrode of gold connected to said source electrically as an anode and adapted to be placed surgically in operative contact with the arthritic joint of a patient, said electrode being in the form of a fine wire having a monofilament portion at the end operatively connected to the joint;

(c) an indifferent electrode connected to said source electrically as a cathode and adapted to be placed in operative contact with the patient's body spaced from said joint; and

(d) said current source having a structure which provides a predetermined current magnitude and said monofilament portion of said wire having a diameter which in combination with said predetermined current magnitude produces anodal corrosion of said monofilament portion to release gold ions;

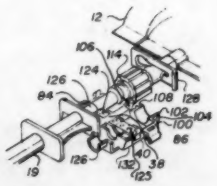
(e) whereby in response to flow of electrical current through said gold electrode gold ions are generated and injected directly into the joint for treatment.

4,405,312

CONNECTING DEVICE FOR MEDICAL LIQUID CONTAINERS

James R. Gross, Bartlett, and Mark E. Larkin, Lindenhurst, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 31, 1981, Ser. No. 298,049
Int. Cl.³ A61M *3/00*
U.S. Cl. 604—29 **21 Claims**



1. An aseptic covering device for the connection between the tubular port of a medical liquid container and a piercing pin comprising:

a clasp member comprising first and second substantially C-shaped body portions hingedly connected to each other and further including latching means at opposing ends thereof; said clasp member being constructed and arranged for the pivotal enclosure of said connection between said medical liquid container and said piercing pin;

a plurality of absorbent sponge members containing an antiseptic solution disposed within each of said substantially C-shaped portions constructed and arranged for aseptic-izing the connection between said tubular port and said piercing pin;

a coaxial tubular end port extending distally from said clasp member and having helically arranged threading disposed thereon; and

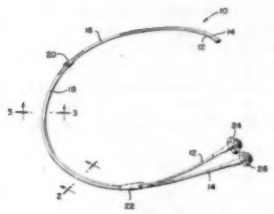
lock nut means coaxially disposed about said tubular port member, constructed and arranged for threaded engagement with said threading means on said tubular end port of said clasp member so as to fixedly attach said tubular port to said clasp member and said piercing pin.

4,405,313

FIGURE-EIGHT, DUAL-LUMEN CATHETER AND METHOD OF USING

James R. Sisley, 3450 Evergreen Point Rd., Bellevue, Wash. 98004, and Robert O. Hickman, 11100 Kulshan Dr., Edmonds, Wash. 98020

Filed Jan. 29, 1982, Ser. No. 343,736
Int. Cl.³ A61M 5/00
U.S. Cl. 604—43 **40 Claims**



1. A dual-lumen catheter suitable for surgical implantation in a patient through a subcutaneous tunnel having a point of entry to the skin and a point of entry to the desired vessel, comprising:

(a) two tubes attached side-by-side to form a figure-8, dual-lumen body;

(b) a first fill-in portion on the body, having a substantially convex, smoothly curving outer locus and bridging the junction of said two tubes, positionable at the point of entry to the skin to reduce the passage of bacteria along the body;

(c) a second fill-in portion on the body, having a substantially convex, smoothly curving outer locus and bridging the junction of said two tubes, positionable at the point of entry to the vessel to reduce blood leakage when the vessel is secured with a ligature; and

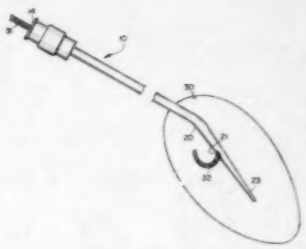
(d) a cuff positionable between the point of entry to the skin and the point of entry to the vein to promote tissue ingrowth which will fix the catheter within the patient after implantation.

4,405,314

APPARATUS AND METHOD FOR CATHETERIZATION PERMITTING USE OF A SMALLER GAGE NEEDLE

Constantin Cope, Elkins Park, Pa., assignor to Cook Incorporated, Bloomington, Ind.

Filed Apr. 19, 1982, Ser. No. 369,598
Int. Cl.³ A61B 17/00; A61M 5/00
U.S. Cl. 604—51 **11 Claims**



7. A method for inserting a catheter into a body cavity, comprising the steps of:

(1) percutaneously inserting a needle having a lumen into a desired position projecting into the body cavity;

(2) inserting a first wire guide through the lumen of the needle so that it projects from the distal end of the needle into the body cavity;

(3) withdrawing the needle from the first wire guide while maintaining the wire guide within the body cavity;

(4) advancing an introducing catheter over the first wire guide to the desired position within the body cavity while maintaining the position of the first wire guide relative to the body cavity;

(5) removing the first wire guide from the introducing catheter while maintaining the introducing catheter in its position relative to the body cavity.

(6) inserting into said introducing catheter a J-type wire guide having a substantially larger diameter than the internal diameter of said introducing catheter at its distal end;

(7) causing said J-type wire guide to automatically emerge through a side port in said introducing catheter by causing said wire guide to move around a curve to said introducing catheter and by positioning the side port on the inside of said curve and toward the distal end of the introducing catheter;

(8) removing said introducing catheter from said J-type wire guide while maintaining the position of said J-type wire guide relative to said body; and

(9) advancing a drainage catheter over said J-type wire guide to a desired position within the body cavity while maintaining the position of said J-type wire guide relative to said body.

4,405,315

SPIKE EXCHANGER FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

Alan E. Handt, Zionsville, Ind., assignor to Stephen R. Ash, Lafayette, Ind., a part interest

Filed Apr. 23, 1982, Ser. No. 371,310
Int. Cl.³ A61M 5/14; A61J 5/00
U.S. Cl. 604—80 **14 Claims**

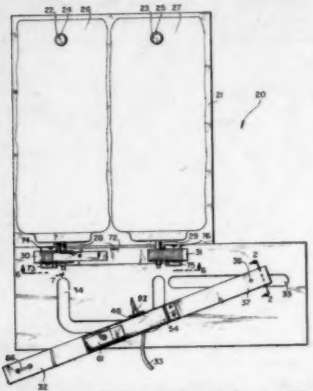
1. A spike exchanger for continous ambulatory peritoneal dialysis comprising:

a base having mounting means to releasably hold a first bag with a first port and a second bag with a second port;

clamp means on said base and engageable with said first port and said second port to releasably limit fluid flow therethrough;

spike holding and moving means movably mounted to said

base and operable to releasably hold a spike in fluid communication with said first port and move said spike away from said first port to said second port; and,



guide means on said base and associated with said spike holding and moving means to guide and align said spike with said second port as said spike is moved thereto.

4,405,316

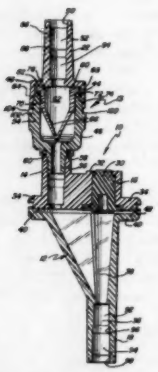
INJECTION SITE WITH CHECK VALVE INLET

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 3, 1978, Ser. No. 892,766

Int. Cl.³ A61M 5/14

U.S. Cl. 604—86 **6 Claims**



1. In an injection site having a body portion, a first inlet, a second inlet with a self-sealing, pierceable member located therein and an outlet, the improvement comprising, in combination:

a check valve housing rigidly attached to said first inlet, said check valve housing enclosing a check valve member which acts to permit fluid flow in only one direction; and

said housing having an interior wall which securely and frictionally engages a portion of the external surface of the check valve member, said housing comprising a lower member; means attaching the lower member to said first inlet; and an upper member;

means connecting said upper member to said lower member, said upper member and said lower member cooperating to provide indicium of a proper and secure connection between said upper and lower members.

4,405,317

SYRINGE ASSEMBLY

Kirt L. Case, Warsaw, Ind., assignor to The West Company, Phoenixville, Pa.

Filed Sep. 30, 1981, Ser. No. 306,954

Int. Cl.³ A61M 5/00

U.S. Cl. 604—90 **6 Claims**

1. In a syringe assembly comprising an outer barrel for a powder medicament, an inner barrel telescopically mounted in the outer barrel for diluent, seal means isolating the powder and diluent compartments comprising a plug member made of a resilient material sealingly engaging in the discharge opening of the inner barrel, plunger means mounted on the discharge end of the inner barrel including a hollow plug chamber closed at one end remote from the discharge end of the inner barrel by a wall having a plurality of discharge openings therein, said plug member including a pintle projecting from one axial end face thereof of said plug member of a diameter less than the body portion of said plug member and greater than the discharge openings in said plunger end wall, said plug member adapted upon pressure buildup in the inner barrel to be displaced axially outwardly into said plug chamber to permit flow of diluent from the inner barrel to the powder compartment.

4,405,318

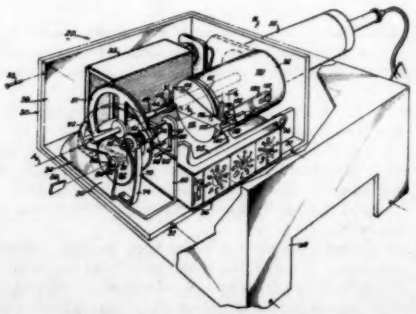
INJECTOR WITH RATCHET DRIVE AND REPRODUCING SYSTEM

Douglas S. G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, and Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,234. This application Mar. 27, 1981, Ser. No. 248,512

Int. Cl.³ A61M 5/20

U.S. Cl. 604—155 **4 Claims**



1. Apparatus for injecting fluid into a patient at an average prescribed rate over a prolonged period of time comprising:

a housing;

carriage means mounted on said housing and defining a fluid chamber therein carrying fluid to be dispensed and an

outlet from said fluid chamber adapted to be connected to the patient;

a piston slidably mounted in said fluid chamber for forcing fluid from said outlet as said piston is moved toward said outlet;

drive screw means operatively associated with said piston for moving said piston toward said outlet as said drive screw means is rotated;

ratchet drive means including a mounting shaft having a central ratchet axis, an output ratchet member fixedly mounted on said mounting shaft about the ratchet axis and operatively connected to said drive screw means for rotating said drive screw means as said output ratchet member is rotated; an input ratchet member rotatably and slidably mounted on said mounting shaft about said ratchet axis, said output and input ratchet members defining a plurality of complementary ratchet teeth thereon facing each other so that said ratchet teeth on said output and input ratchet members engage when said input ratchet member is moved toward said output ratchet member; spring means for resiliently urging said input ratchet member toward said output ratchet member, said complementary ratchet teeth arranged so that said output ratchet member is rotated in a first direction and so that said input ratchet member can ratchet with respect to said output ratchet member as said input ratchet member is rotated in the opposite direction without rotating said output ratchet member; and a drive projection connected to said input ratchet member so that said drive projection rotates said input ratchet member about said ratchet axis as said drive projection is pivoted back and forth about said ratchet axis;

an electrically operated solenoid including an actuator member moved in response to electrically energizing said solenoid;

connection means operatively connecting said actuator member on said solenoid to said drive projection on said ratchet drive means so that said connection means will pivot said drive projection and said input ratchet member in said first direction to drivingly rotate said output ratchet member therewith when said solenoid is energized, yet said connection means will not pivot said drive projection in the direction opposite said first direction when said solenoid is de-energized so as to isolate said ratchet drive means from said solenoid;

return spring means operatively connected to said drive projection to pivot said drive projection in said opposite direction when said solenoid is de-energized;

an electrical power supply; and

control means for selectively connecting said electrical power supply to and disconnecting said electrical power supply from said solenoid to successively and alternatively energize and de-energize said solenoid at a rate such that fluid is incrementally injected into the patient at the desired average prescribed rate over the prolonged period of time so that, if said control means fails so as to continuously connect said electrical power supply to said solenoid, said piston will be moved only an incremental prescribed distance toward said outlet to prevent overdosing the patient.

4,405,319

POROUS TITANIUM COATING FOR BLOOD ACCESS DEVICE

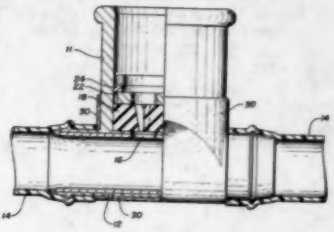
Louis C. Cosentino, Wayzata, Minn., assignor to Renal Systems, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 261,719, May 8, 1981, which is a continuation of Ser. No. 138,579, Apr. 8, 1980. This application Sep. 18, 1981, Ser. No. 303,348

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—175 **8 Claims**

1. An implantable blood access device for providing access to the circulatory system comprising a rigid body of biologically compatible material, said body having a generally T-shaped tubular configuration with the stem of the T joined to and in fluid communication with the arms of the T, said stem having a substantially constant outer diameter from the junction of the stem and the arms of the T to at least the excutaneous portion of the stem, an elastomeric septum member supported within the cavity of the stem, and removable retaining means for holding the septum with the stem in sealed relationship therewith, wherein said rigid body has a matte titanium finish on at least a portion of the subcutaneous exterior surfaces of the device and wherein said matte finish is limited to said subcutaneous surfaces.



4,405,320

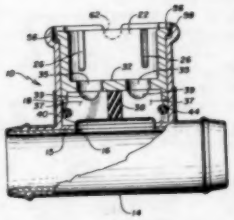
SEPTUM RETAINING MEANS FOR PERCUTANEOUS DEVICE

Raymond F. Cracauer, Minneapolis; Larry E. Fuller, Minnetonka; Felix J. Martinez, Plymouth, and Louis C. Cosentino, Wayzata, all of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Feb. 22, 1982, Ser. No. 350,574

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—175 **15 Claims**



1. In a percutaneous device having a generally tubular body with the body exterior tubular portion including communication with a body interior portion, said device including a septum closure in the tubular portion and a removable retaining means for retaining said septum within the tubular cavity of said device, wherein the improvement resides in the retaining means, a septum closure in the stem portion, said improved retaining means comprising a tubular septum retaining insert, the exterior configuration of which closely conforms to the configuration of the stem cavity, the insert including:

an integral pressure plate member located at an intermediate region between the top and the bottom of said insert so as to define an upper insert chamber above the pressure plate and a lower insert chamber below the pressure plate, said pressure plate having at least one cannula hole therethrough; and,

at least one locking tab member projecting outwardly from near the upper edge of said insert, said locking tab sized to fit within a retaining groove within the stem cavity, each said locking tab having on either side thereof an elongated

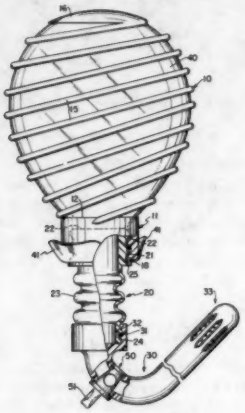
notch extending downwardly through the insert wall whereby the insert wall portion carrying the tab may be flexed inwardly and the insert may be passed into and out of the stem cavity.

4,405,321

DOUCHE DELIVERY DEVICE

Penny W. Budoff, 11 Fairbanks Blvd., Woodbury, N.Y. 11797

Filed Feb. 26, 1982, Ser. No. 352,805
Int. Cl.³ A61M 1/00
U.S. Cl. 604—212 **14 Claims**



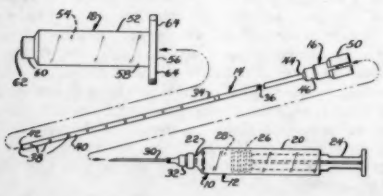
1. A douche delivery device comprising:
an outer container;
a retainer secured at its upper end to the lower portion of said outer container, said retainer having an opening formed therein extending from the upper to the lower end of said retainer;
a disposable douche preparation container positioned substantially within said outer container and secured thereto by said retainer; and
a nozzle being hollow along its length and having a valve positioned along said nozzle, one end of the nozzle being secured to the lower end of said retainer, said nozzle being arcuately shaped so as to allow easy insertion of the second end of said nozzle into the vagina for douching while seated.

4,405,322

ANESTHESIA DEVICE

James L. Jessup, Elk Grove Village, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 23, 1981, Ser. No. 334,030
Int. Cl.³ A61M 5/00
U.S. Cl. 604—232 **5 Claims**



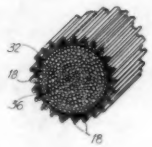
1. An anesthesia device, comprising:
a syringe having a barrel defining a chamber, a hollow needle at a distal end of the syringe and having a sharp distal end, and means for pumping fluid from the chamber through said needle;
a holding member having a wall with an inner diameter slightly larger than the outer diameter of the syringe barrel, an open proximal end, and an opening at a distal end of the holding member, with said wall defining a cavity to receive the syringe barrel;
an elongated cannula having a lumen, and a plurality of apertures in a distal portion of the cannula communicating with said lumen; and
a hollow adapter secured to a proximal end of the cannula, said adapter receiving a distal portion of the syringe with the needle received in the cannula lumen, and said holding member receiving the syringe and attached cannula with the syringe barrel received in the holding member cavity, with the cannula extending distally from the holding member opening, and with the adapter releasably received in the holding member.

4,405,323

SANITARY NAPKIN

Sidney Auerbach, 246 W. End Ave., New York, N.Y. 10023

Filed Sep. 8, 1981, Ser. No. 299,813
Int. Cl.³ A61F 13/20
U.S. Cl. 604—285 **7 Claims**



1. A tampon comprising an elongated absorbing member having first and second ends and constructed of an absorptive material and incorporating a substance which kills pathogens within the surface or substance of said absorbing member, said member being housed within a smooth surfaced tubular container, having inner and outer surfaces, both the inner and outer surfaces of said tubular container being coated with said substance or the like.

4,405,324

ABSORBENT CELLULOSIC STRUCTURES

Mamerto M. Cruz, Jr., Pennington, N.J., assignor to Morca, Inc., Pennington, N.J.

Filed Aug. 24, 1981, Ser. No. 295,768
Int. Cl.³ A61F 13/00
U.S. Cl. 604—376 **14 Claims**

1. Absorbent, coherent, flexible cellulosic structures for application to the body comprising water-insoluble cellulose derivatives of the group of cellulose ethers, cellulose mixed ethers and cellulose ether mixed esters prepared from highly fibrillated, chemically purified wood pulp having a CSF not exceeding about 150, the cellulose derivative having a total DS of between about 0.05 to about 0.35, said structures being further characterized in that when applied to the body and wet with aqueous body liquid the protruding fibrils and microfibrils on the surfaces and along the edges of the structures become highly swollen almost instantaneously whereby the structures

are non-irritating to the body over the area to which the structure is applied and in having a higher liquid absorbency than a like structure formed from underivatized, unfibrillated cellulose.

4,405,325

HYDROPHOBIC NONWOVEN FABRIC BONDED BY A COPOLYMER FORMED FROM A DIENE

George J. Antlfinger, Avon Lake, and Pravinchandra K. Shah, Sheffield Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 3, 1981, Ser. No. 289,343
Int. Cl.[3] A61F *13/16;* B32B *27/12;* D04H *1/64*
U.S. Cl. 604—370 11 Claims

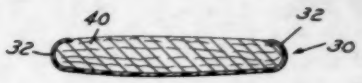
1. A nonwoven fabric comprising fibers at least 50% of which are hydrophobic fibers bonded together by means selected from the group consisting essentially of a binder comprising a water-insoluble, hydrophobic polymer of unsaturated monomers comprising 50 to 80 parts by weight of an ethylenically unsaturated monomer selected from styrene, α-methyl styrene, methyl methacrylate and mixtures thereof, and 50 to 20 parts by weight of a diene monomer selected from butadiene, isoprene, and mixtures thereof, said bonded fabric has a minimum dry and wet tensile strength of 170 g/in and 155 g/in in across machine direction, respectively, a maximum strike through of 7.0 seconds, and a maximum surface wetness of 0.5 g.

4,405,326

CATAMENIAL BANDAGE

Arlene R. Lenaghan, 674 Rudgate, Bloomfield Hills, Mich. 48013

Filed Jun. 1, 1981, Ser. No. 269,360
Int. Cl.[3] A61F *13/18*
U.S. Cl. 604—385 1 Claim



1. A catamenial bandage pad which comprises:
(a) a molded shell of soft, resilient, form-retaining material having a plate portion elongate in form extending transversely and longitudinally of the pad, said shell having curved sides extending in a direction perpendicular to the plate portion and narrowing from the longitudinal center of the pad to the ends, and
(b) an absorbent material extending over said plate between said curved sides,
(c) said shell and absorbent material being enveloped in a gauze covering, said covering having a transverse slit on the outside of said pad adjacent one end, said covering between said slit and the end to which it is adjacent being peelable away and stretchable over the other end of said pad when folded to said first end to retain said pad in folded condition.

4,405,327

METHOD FOR INHIBITING MINERALIZATION OF NATURAL TISSUE DURING IMPLANTATION

Elisabeth M. Pollock, Sandy, Utah, assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Aug. 25, 1982, Ser. No. 411,190

Int. Cl.³ A61F *1/22*

U.S. Cl. 8—94.11 **22 Claims**

1. A method for inhibiting the mineralization of fixed natural tissue after implantation in a living body comprising contacting fixed natural tissue intended for implantation with an aqueous solution of a water soluble quaternary ammonium salt whose nitrogen atom has at least one alkyl group containing from 7 to 15 carbon atoms.

4,405,328

PREPARATION FOR SHRINKPROOFING WOOL

Friedhelm Nickel; Götz Koerner; Günter Schmidt, all of Essen, and Hans Rott, Gladbeck, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,569

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034380

Int. Cl.³ D06M *13/10*

U.S. Cl. 8—128 A **15 Claims**

1. A composition for shrinkproofing wool comprising

(a) from about 1 to 50 weight percent of organopolysiloxanes composed of

(aa) 80 to 99.8 weight percent of units of the formula

$$R_n{}^1SiO_{\frac{4-n}{2}}$$

and

(ab) 0.2 to 20 weight percent of units of the formula

$$R_m{}^2SiO_{\frac{4-m}{2}}$$

in the form of copolymers or in the form of mixtures in each case of siloxanes with units of formula (aa) and siloxanes with units of formula (ab), wherein the R^1 radicals consist of mercaptoalkyl or mercaptoaryl radicals to the extent of 0.03 to 3 moles percent and the R^2 radicals of hydrogen atoms to the extent of 5 to 50 mole percent, the remaining portion of R^1 and R^2 radicals being methyl radicals of which up to 10 mole percent may be replaced by longer-chain alkyl, aryl, or hydrogen radicals, n has a value of 1.8 to 2.0 and m has a value of 2.0 to 2.5, and

(b) about 50 to 99 weight percent of water.

4,405,329

STABLE CONCENTRATED FLUID FORMULATIONS OF METAL-FREE DYES, PROCESS FOR THEIR PREPARATION, AND THEIR USE

Heinz Abel, Reinach, and Paul Hugelshofer, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,978

Claims priority, application Switzerland, Jun. 4, 1980, 4334/80

Int. Cl.³ C09B *67/42, 67/46;* **D06P** *1/04, 1/20*

U.S. Cl. 8—527 **32 Claims**

1. A method of preparation of a spray solution for dyeing leather, which comprises diluting a stable concentrated fluid formation with water, organic solvents, or a mixture of water and organic solvents, the fluid formulation containing, in the absence of metallized dyes:

(1) a metal-free leather dye consisting essentially of a monoazo or polyazo dye or an anthraquinone dye,

(2) a non-ionic compound having a hydrotropic action, at least one of the components (3) or (4), the component

(3) being a reaction product of a fatty acid having 8 to 22 carbon atoms and 1 to 2 mols of diethanolamine, and the component

(4) being a compound of the formula

$$R-A-(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)_m-X$$

in which R is an aliphatic hydrocarbon radical having 8 to 22 carbon atoms or a cycloaliphatic, aromatic or aliphatic-aromatic hydrocarbon radical having 10 to 22 carbon atoms, R_1 is hydrogen or methyl, A is —O— or

$$-\underset{\displaystyle O}{\underset{\|}{C}}-O-,$$

X is the acid radical of an inorganic oxygen containing acid, the acid radical of a polybasic carboxylic acid or a carboxyalkyl radical and m is a number from 1 to 50, and

(5) water, a water-soluble organic solvent having a boiling point of at least 80° C., or a mixture of the two.

4,405,330

NAVY DISPERSE DYE MIXTURES

Udo Bergmann, Darmstadt; Helmut Degen, Frankenthal; Guenter Hansen, Ludwigshafen; Reinhold Krallmann, Weisenheim, and Wolf-Dieter Kermer, Fussgoenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

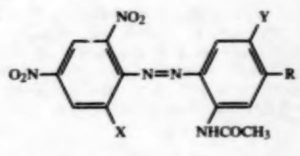
Filed Oct. 8, 1982, Ser. No. 433,393

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142609

Int. Cl.³ C09B *29/08;* **D06P** *1/04*

U.S. Cl. 8—639 **2 Claims**

1. A navy disperse dye mixture which contains dyes of the formula



I

where

X is chlorine or bromine,

Y is hydrogen, methoxy or ethoxy and

R is $N(C_2H_5)_2$, $N(CH_2CH{=}CH_2)_2$ or $N(C_2H_4OCOCH_3)_2$,

the mixtures being composed of 10–70% of dyes with Y=H and $R{=}N(C_2H_5)_2$, 5–40% of dyes with $Y{=}OCH_3$ or OC_2H_5 and $R{=}N(CH_2{-}CH{=}CH_2)_2$ and 5–80% of dyes with $Y{=}OCH_3$ or OC_2H_5 and $R{=}N(C_2H_4OCOCH_3)_2$.

4,405,331

REFUSE DERIVED FUEL AND A PROCESS FOR THE PRODUCTION THEREOF

Eric W. Blaustein, and Edward J. Patton, both of Pittsburgh, Pa., assignors to Acres American Incorporated, Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,218

Int. Cl.³ C10L *5/48, 5/14*

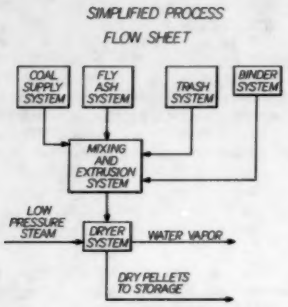
U.S. Cl. 44—1 D **23 Claims**

5. A refuse derived fuel comprising an intimate mixture of:

(a) from about 5 to 30% by weight of solid refuse which is substantially cellulose-base material substantially free of glass and metallic materials;

(b) from about 40 to 70% by weight fly ash;
(c) from about 10 to 40% by weight coal fines; and
(d) from about 1 to 15% by weight binder.

18. A process for the production of a refuse derived fuel comprising intimately mixing:



(a) from about 5 to 30% by weight solid refuse which is substantially cellulose-base material substantially free of glass and metallic materials;
(b) from about 40 to 70% by weight fly ash;
(c) from about 10 to 40% by weight coal fines; and
(d) from about 1 to 15% by weight binder.

4,405,332

ALTERNATIVE FUEL COMPRISED OF SEWAGE SLUDGE AND A PARTICULATE SOLID FUEL

Larry A. Rodriguez, 7452 18th St. NE., St. Petersburg, Fla. 33702; Antonio A. Padilla, 15803 Deep Creek La., Tampa, Fla. 33624; Robert A. Ashworth, 1017 41st Ave. NE., St. Petersburg, Fla. 33703, and Ned B. Spake, 2711 Summerfield Rd., Winter Park, Fla. 32792

Filed Jul. 28, 1981, Ser. No. 287,581
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **6 Claims**

1. An improved fuel composition comprising from about 25 to 40 percent by weight of non-dewatered sewage sludge and from about 60 to 75 percent by weight of a particulate solid fuel, said non-dewatered sewage sludge comprising from about 85 to 99.5 percent by weight of water and from about 0.5 to 15 percent by weight of combustible solids.

4,405,333

DIESEL FUEL COMPOSITION

Paul D. Seemuth, Oak Park, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 27, 1982, Ser. No. 423,606
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—53 **7 Claims**

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, said fuel containing a cetane number increasing amount of a tetrahydropyranol nitrate.

4,405,334

DIESEL FUEL COMPOSITION

Paul D. Seemuth, Oak Park, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 27, 1982, Ser. No. 424,053
Int. Cl.³ C01L *1/22*
U.S. Cl. 44—53 **13 Claims**

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, said fuel containing a cetane number increasing amount of a 1-alkylpiperidinol nitrate.

4,405,335

DIESEL FUEL COMPOSITION

Paul D. Seemuth, Oak Park, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 27, 1982, Ser. No. 424,054
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—53 **3 Claims**

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, said fuel containing a cetane increasing amount of a tetrahydrofurandiol dinitrate cetane improver.

4,405,336

FUEL COMPOSITION

Stephen L. Badger, Jackson, Miss., assignor to Tandy Wansley, Valley Park, Miss.

Filed Jul. 30, 1981, Ser. No. 288,418
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—56 **5 Claims**

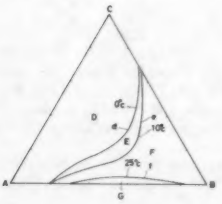
1. A composition comprising:
1000 parts by volume of at least 90%/180 proof ethyl alcohol;
60–90 parts by volume of methylisobutyl ketone;
20–50 parts by volume of kerosene;
30–60 parts by volume of xylenes, and
20–50 parts by volume of isopropyl alcohol.

4,405,337

FUEL FOR DIESEL ENGINE

Mitsuyoshi Mori, Amagasaki, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Continuation of Ser. No. 166,844, Jul. 8, 1980, abandoned. This application May 17, 1982, Ser. No. 378,814
Claims priority, application Japan, Apr. 10, 1980, 55-47132; May 14, 1980, 55-63515
Int. Cl.³ C10L *1/08*
U.S. Cl. 44—56 **4 Claims**



1. A fuel for a diesel engine which consists essentially of a mixture of (A) an alcohol, (B) gas oil and (C) castor oil, wherein the contents of the respective components satisfy requirements represented by the following formulae:
0% by volume$<$A$\leqq$80% by volume,
10% by volume$\leqq$B$<$50% by volume, and
10% by volume$\leqq$C$<$50% by volume.

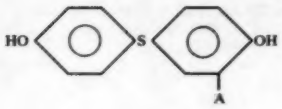
4,405,338
EXTENDED AVIATION JET FUEL STABILIZED WITH PHENOALDEHYDE AMINE DERIVATIVES

Robert H. Jenkins, Jr., Walden, and William M. Sweeney, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,878
Int. Cl.³ C10L 1/24; C07C 87/28
U.S. Cl. 44—78 23 Claims

1. The method of improving the thermal stability of a hydrocarbon fuel heavier than gasoline which comprises

mixing (i) a major portion of a hydrocarbon fuel heavier than gasoline and (ii) a minor thermal stability-improving amount of, as a thermal stability-improving additive,



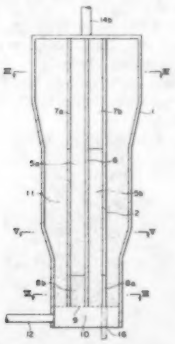
wherein A is

R is a primary or a secondary C_4–C_{20} alkyl, cycloalkyl, or alkenyl hydrocarbon group, and R′ is hydrogen or a C_1–C_4 alkyl hydrocarbon group, thereby forming a hydrocarbon fuel product of improved thermal stability; and recovering said product.

4,405,339
PROCESS AND APPARATUS FOR GASIFYING COMBUSTIBLE MATERIALS

Daizo Kunii, Tokyo, Japan, assignor to Mitteta Chemical Engineering, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,358
Claims priority, application Japan, Aug. 7, 1980, 55/107744; Mar. 19, 1981, 56/38719
Int. Cl.³ C10J 3/56
U.S. Cl. 48—62 R 7 Claims



1. An apparatus for the gasification of combustible materials, comprising:

an outer tubular housing member for enclosing a bed of fluidized solid particles;

an inner tubular housing member placed inside of said outer housing member and coaxially aligned therewith to define an annular space therebetween;

at least two partition plate members extending along the length of said housing members and radially between said outer and inner housing members for dividing said annular space into at least two compartments, one of said compartments acting as a cracking zone and another one of said compartments acting as a heat-up zone;

means extending axially within said inner housing member for dividing the inside space thereof into at least two channels, corresponding in number to the number of said compartments;

said inner housing member having an upper openings and a lower opening for each of said compartments, said openings positioned so that each one of said channels is in fluid communication with a corresponding one of said compartments through one of said upper openings and with the compartment adjacent to said corresponding compartment through one of said lower openings, whereby said compartments are connected in series as a closed loop by said channels;

means for supplying fluidizing gases to said compartments and channels so that the solid particles in the respective compartments and channels may be maintained in a fluidized state and continuously recirculated through said closed-loop, successively, up respective compartments and down respective channels;

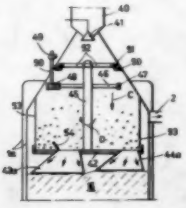
means for feeding the combustible materials to said cracking zone, whereby the combustible materials are cracked in said cracking zone by contact with the bed of ascending solid particles to form a gaseous product and a carbonaceous material, the carbonaceous material being entrained with the solid particles and combusted, at least in part, in said heat-up zone by contact with the oxygen to heat the solid particles in said heat-up zone, the heated solid particles being recycled to said cracking zone for the utilization of their heat for effecting the cracking; and

a discharge port for withdrawing the gaseous product from said cracking zone.

4,405,340
PROCESS AND APPARATUS FOR CHARGING SOLID FUELS INTO A FIXED-BED GASIFIER

Hans Küpfer, Frankfurt am Main, and Paul Rudolph, Bad Homburg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,429
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032949
Int. Cl.³ C10J 3/30
U.S. Cl. 48—86 R 5 Claims



1. In a reactor for the gasification of solid carbonaceous fuel with oxygen, steam and/or carbon dioxide as gasifying agents, said fuel having a grained-sized distribution from dust like grains to a grain size of more than 3 mm. up to 100 mm., in said reactor said fuel forming a fixed bed and the gasifying agents passing upwardly through said fixed bed, within said reactor in its upper portion above said fixed bed a disc-shape distributor

being horizontally disposed, means for rotating said distributor about a vertical axis, means for feeding said fuel from above to fall on fuel on said distributor, and a stationary cylindrical wall surrounding the fuel on said distributor, said wall having about the same diameter as the distributor, the improvement wherein said distributor has at least one inner passage and one outer passage for fuel to flow on said fixed bed, each passage having an inlet remote from said fixed bed and an outlet close to said fixed bed, the inlet of the outer passage being disposed near the periphery of said distributor and the inlet of the inner passage being disposed near the center of rotation of said distributor and wherein said means for feeding fuel, said distributor, and said passages are arranged and constructed so that the fuel is classified with coarse fuel being delivered through said outer passage and finely sized fuel through said inner passage.

4,405,341
RESIN COATED FABRIC

Juergen Jaschek, and Wolf Krummheuer, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzona, Incorporated, Asheville, N.C.

Filed Aug. 18, 1980, Ser. No. 179,252

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933307

Int. Cl.³ C09K *3/14*

U.S. Cl. 51—298 **22 Claims**

1. A coated fabric comprising a fabric of continuous multifilament threads, the fabric having a density ranging between 26% and 60%, a first coating applied to the fabric and a second coating applied over the first coating, the first and second coating each comprising a mix of a dispersable elastic and/or thermoplastic substance with a highly crosslinked duroplastic substance, the proportion of the elastic and/or thermoplastic substance to highly crosslinked duroplastic substance in each mix varying from the first coating to the second coating.

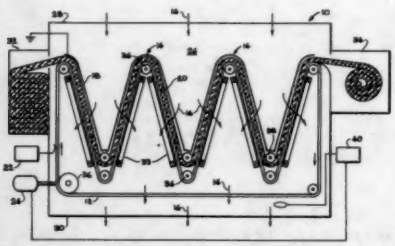
4,405,342
ELECTRIC FILTER WITH MOVABLE BELT ELECTRODE

Werner Bergman, Pleasanton, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Feb. 23, 1982, Ser. No. 351,679

Int. Cl.³ B03C *3/00*

U.S. Cl. 55—6 **10 Claims**



1. A method for removing contaminants from an air stream, comprising:

providing an electric filter characterized by a movable, endless, perforated belt electrode having a plurality of pleats arranged generally longitudinally with respect to the flow of a gas stream, a grounded electrode adapted to fit in a closely-mated, spaced-apart relationship with said belt electrode, and a filter medium sandwiched between and engaged with said electrodes;

polarizing said filter medium by forming an electric field between said electrodes;

passing an air stream through said electric filter in a direction generally longitudinal with respect to said pleats; and

collecting contaminants dispersed throughout said air stream on said filter medium.

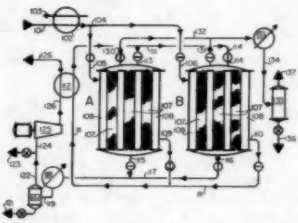
4,405,343
METHANOL DEHYDRATION

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Filed Sep. 1, 1982, Ser. No. 413,744

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—28 **21 Claims**



1. In the process of dehydrating by adsorption on solid particulate desiccant, of water vapor from a hot gas stream containing methanol vapors and water vapors initially at a temperature of 300° C. to 500° C. and a pressure higher than atmospheric, wherein all of the mechanical and thermal energy required in said process of dehydrating by adsorption is obtained from said gas stream due to its high temperature and high pressure relative to ambient conditions.

4,405,344
METHOD AND EQUIPMENT FOR VOLUMETRICALLY CONTROLLED AND REPRODUCIBLE INTRODUCTION OF SMALL AMOUNTS OF LIQUID SAMPLES INTO CHROMATOGRAPHIC ANALYSIS SYSTEMS

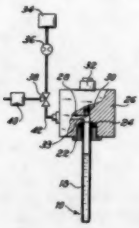
Giorgio Sisti, Milan, Italy; Sorin Trestianu, Brussels, Belgium, and Ermete Riva, Como, Italy, assignors to Carlo Erba Strumentazione S.p.A., Rodano, Italy

Filed Sep. 23, 1981, Ser. No. 304,780

Claims priority, application Italy, Sep. 30, 1980, 25018 A/80; May 4, 1981, 21504 A/81

Int. Cl.³ B01D *15/08*

U.S. Cl. 55—67 **22 Claims**



1. A method for reproducibly injecting a very small, volu-

metrically controlled liquid sample for chromatographic analysis, said method comprising the steps of:

(a) preparing a sample container having a larger volume than the desired sample volume and having a pipette- or nozzle-shaped neck at its outlet, terminating in an opening with a diameter of 1–100 μm;

(b) introducing into said container a volume of liquid sample greater than the desired sample volume, in such a manner that a meniscus of the sample liquid forms at said outlet opening, and positioning the filled sample container for sample injection into the chromatographic system; and

(c) applying to the liquid inside the sample container at least one pressure pulse of controlled duration and amplitude, the maximum amplitude of each said pressure pulse being higher than the pressure necessary to overcome the surface tension of the sample liquid at said meniscus, the duration being sufficient to eject a desired volume of sample liquid, and the pressure drop at the end of each pulse being sufficiently abrupt as to avoid formation of a droplet of sample which is not ejected but instead adheres to said outlet opening.

4,405,345

DEVICE FOR SEPARATING LIQUID FROM LIQUID-CONTAINING COMPRESSED GAS

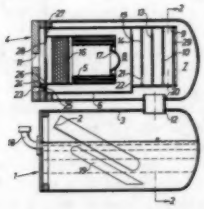
Gosewinus F. van Oorschot, Breda, Netherlands, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 5, 1982, Ser. No. 346,239

Claims priority, application Sweden, Mar. 9, 1981, 8101460

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—184 **4 Claims**



1. Device for separating liquid from liquid-containing compressed gas, comprising:

(a) a first horizontal tank (1) defining a first stage separation compartment;

(b) nozzle means (2) for injecting a stream of compressed air and liquid into said first stage compartment, said nozzle means inclining towards the interior wall of said compartment to impart a centrifugal action to said stream as it impinges against said wall to thereby separate liquid from the compressed gas;

(c) a second horizontal tank (4) defining a second stage separation compartment mounted above said first horizontal tank;

(d) a closed horizontal shell (6) having an inlet and an outlet mounted within said second tank (4), defining an outer chamber (7) and an inner chamber (8) in said second stage separation compartment;

(e) means for passing the first stage separation product into said outer chamber (7);

(f) an opening (9) in the upper wall of said shell, at the inlet end thereof, for passing the first stage separation product into said inner chamber (8);

(g) baffle means (10, 13, 14, 15) in said shell (6) downstream of said opening (9), imparting a reversing flow pattern to said first stage separation product as it is passed into said inner chamber (8) to thereby produce a further gas and liquid separation;

(h) filter means (5) in said inner chamber (8) downstream of said baffle means for final separation of liquid from the compressed gas;

(i) the outlet end of said shell having gas escape means (28) allowing the filtered compressed gas to pass into said tank (4); compressed air therefrom; and

(k) means for removing separated liquid from said second stage separation compartment.

4,405,346

CLEANER WITH DIRT CUP

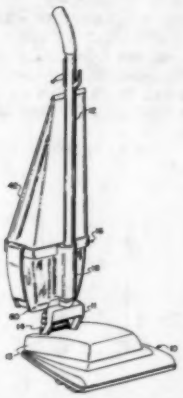
Donald B. Tschudy, and Emmett D. Lorson, both of Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Jul. 13, 1981, Ser. No. 282,443

Claims priority, application United Kingdom, May 13, 1981, 8114567

Int. Cl.³ B01D *46/48*

U.S. Cl. 55—357 **7 Claims**



1. In an upright vacuum cleaner having a handle extending from a main body portion of said cleaner, a fill tube in confluent communication with a dirt collecting bag and a dirt cup holder from which a dirt cup depends, the improvement including: a lateral extent on said dirt cup holder and a tubular portion extending downwardly from said lateral extent, said lateral extent surrounding said handle and said tubular portion extending telescopically over it so that said dirt cup holder can move freely up and down said handle, said dirt collecting bag having lower reaches adjacent to and attached to said dirt cup holder, said handle being pivoted to said main body portion of said cleaner, and said dirt cup holder telescopically moving along said handle as said handle pivots relative to said main body portion.

4,405,347

ADSORBENT UNIT FOR MOUNTING IN THE UPPER PORTION OF A REFRIGERANT RECEIVER

John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,227

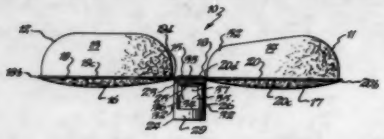
Int. Cl.³ B01D *53/04*

U.S. Cl. 55—387 **31 Claims**

1. An adsorbent unit comprising a pair of containers having porous walls, adsorbent in said containers, harness means coupling said containers to each other, and mounting means for mounting said adsorbent unit on a refrigerant conduit in the upper portion of a refrigerant receiver.

7. An adsorbent unit comprising a container having a porous wall, adsorbent in said container, a harness including a planar member extending outwardly beyond said container, and a

mounting bracket on said planar member for mounting said harness on the upper portion of a refrigerant conduit having an open end at the top of a refrigerant receiver, said mounting



bracket comprising a tubular member having a longitudinal axis which extends transversely to said planar member for mounting in telescopic relationship on said upper portion of said refrigerant conduit.

4,405,348

COOLING DEVICE PARTICULARLY FOR HEAT PROTECTIVE SUITS

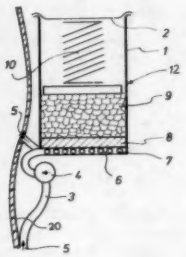
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,179

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045110

Int. Cl.³ F25D *23/12*

U.S. Cl. 62—259.3 **4 Claims**



1. A method of cooling a heat protective device, such as a vest, using a solid refrigerant disposed over a heat exchange surface, comprising, circulating an intermediate liquid cooling agent over said surface and through the garment, and in order to increase the heat transfer of the solid refrigerant, disposing a flexible intermediate layer between the solid refrigerant and the surface and saturating the layer with a fluid which remains liquid below the sublimation point of the solid refrigerant.

4,405,349

INDIRECT-DIRECT FREEZE EXCHANGE CONCENTRATOR AND METHOD

Shib P. Mukherjee, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 20, 1982, Ser. No. 380,110

Int. Cl.³ B01D *9/04*

U.S. Cl. 62—532 **10 Claims**

1. A freeze concentration apparatus comprising:

a warm concentrator tank;

a conduit means to deliver an aqueous liquid mixture feed stream to the warm concentrator tank;

a cold concentrator tank;

conduit means to feed a liquid mixture from the cold concentrator tank to a primary freeze exchanger for indirect cooling by heat exchanger to a cold fluid to form ice crystals in the liquid mixture;

means to feed the liquid mixture containing ice crystals from the primary freeze exchanger to the cold concentrator tank;

conduit means to withdraw liquid mixture from the cold concentrator tank concentrated by the freezing of water therefrom;

means to withdraw an ice slurry from the cold concentrator tank and deliver it to the warm concentrator tank;

means to withdraw an ice slurry from the warm concentrator tank and without prior cooling in a second freeze exchanger deliver it directly to an ice slurry washer;

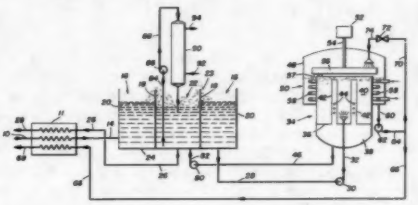
means to wash the ice slurry in the washer with water and to collect washed ice and an aqueous mixture;

conduit means to remove the aqueous mixture from the washer and deliver it directly to the cold concentrator tank; and

means to remove the washed ice from the washer.

5. A method comprising:

delivering an aqueous liquid mixture feed stream to a warm concentrator tank;



feeding a liquid mixture from a cold concentrator tank to a primary freeze exchanger for indirect cooling by heat exchanger to a cold fluid to form ice crystals in the liquid mixture;

feeding the liquid mixture containing ice crystals from the primary freeze exchanger to the cold concentrator tank;

withdrawing liquid mixture from the cold concentrator tank concentrated by the freezing of water therefrom;

withdrawing an ice slurry from the cold concentrator tank and delivering it to the warm concentrator tank;

withdrawing an ice slurry from the warm concentrator tank and without prior cooling in a second freeze exchanger delivering it directly to an ice slurry washer;

washing the ice slurry in the washer with water and collecting washed ice and an aqueous mixture;

removing the aqueous mixture from the washer and delivering it directly to the cold concentrator tank; and

removing the washed ice from the washer.

4,405,350

DRYING AND PREHEATING AGGLOMERATES CONTAINING CLAY HAVING COARSE PARTICLE SIZE

Mark A. Propster, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

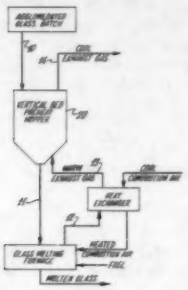
Filed Aug. 7, 1980, Ser. No. 176,165

Int. Cl.³ C03B *1/00, 3/00*

U.S. Cl. 65—27 **9 Claims**

1. In a process for producing glass by charging to a melting furnace and melting therein a batch comprising the steps of agglomerating the batch using a liquid, charging the wet agglomerates onto the upper surface of a vertical bed preheat hopper having a lower discharge end communicating with the furnace, substantially simultaneously (1) withdrawing agglomerates through said lower discharge end for charging to the furnace, (2) moving the remaining agglomerates by gravity downwardly through the bed, (3) passing the hot furnace exhaust gas upwardly through the bed to heat the agglomerates therein, and (4) drying the wet agglomerates on the upper region of the bed with spent exhaust gas which was already passed through the bed, wherein the agglomerated batch con-

tains a sufficient amount of clay having a coarse particle size which results in an agglomerate having insufficient pore vol-



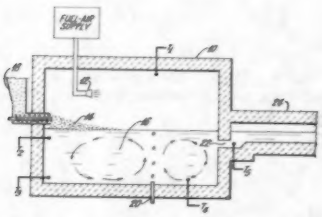
ume to induce the drying of step (4) and reduce the agglomerate's spalling tendencies.

4,405,351

METHOD FOR CONTROLLING A GLASS MELTING FURNACE

Isac M. Sheinkop, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 29, 1981, Ser. No. 278,790
Int. Cl.³ C03B 5/24
U.S. Cl. 65—29 4 Claims



1. A method for controlling the melting of heat-softenable mineral material in a furnace comprising:

a. measuring the temperature T of the mineral material in said furnace;

b. measuring the heat input Q used to raise the temperature of the mineral material in said furnace;

c. calculating the entropy E according to the equation

$$E=(Q/T)$$

d. comparing E with a setpoint entropy E_O, said setpoint being developed historically to provide the most uniform temperature for the mineral material exiting said furnace;

e. changing the rate of heat input Q to a new value of heat input Q' responsive to the comparison of E with E_O to reduce the difference between E and E_O; and

f. supplying heat input Q' to said furnace.

4,405,352

METHOD OF MELTING GLASS ON MOLTEN METAL ALLOYS

Karl H. Bloss, Pittsburgh, and Royann L. Stewart, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1982, Ser. No. 344,460
Int. Cl.³ C03B 18/18
U.S. Cl. 65—99.4 5 Claims

1. A method of melting glass comprising: feeding a glass batch of particulate oxygen containing materials onto the surface of a pool of molten metal, the molten metal including a substantial amount of copper; heating the batch materials on the molten metal to melt the batch materials to form a molten glass layer floating on the molten metal; and maintaining in the molten metal of the pool a concentration of an additional element selected from the group consisting of silicon, aluminum, magnesium, boron, manganese, molybdenum, iron, and cobalt sufficient to inhibit oxidation of copper.

4,405,353

CARBOFURAN-CONTAINING PLANT PROTECTING COMPOSITIONS

Sandor Angyan; Istvan Racz; Erzsebet Radvanyi; Ferenc Kovats; Tamas Detre, and Jozsef Sos, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Nov. 26, 1980, Ser. No. 211,321
Claims priority, application Hungary, Nov. 28, 1979, CI 1991
Int. Cl.³ A01N 25/12, 43/08
U.S. Cl. 11—3 6 Claims

1. An insecticidal composition with improved plant growth accelerating properties containing 1 to 50% by weight of 2,3-dihydro-2,2-dimethyl-7-benzofuranol methyl carbamate and 50 to 99% by weight of a carrier prepared by partial hydrolysis of granulated vegetable waste matter selected from the group consisting of corncobs, cornstalks, chopped wood or sawdust from broad-leafed trees, rice hulls, and reeds.

4,405,354

ELIMINATION OF ODORS FROM WASTE MATERIAL

Johnny M. Thomas, II, Fort Collins, and Richard P. Mommer, Loveland, both of Colo., assignors to Uniscope, Inc., Johnstown, Colo.

Filed Apr. 2, 1980, Ser. No. 136,553
Int. Cl.³ A01K 1/015; C05F 3/00
U.S. Cl. 71—21 24 Claims

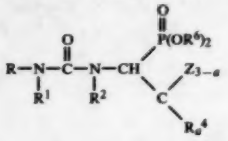
1. A method for controlling and eliminating ammonia odor from organic waste material comprising uniformly contacting said waste material with a composition consisting essentially of an effective amount of an ammonia control component selected from the group consisting of monobasic salts of dibasic acids, and mono-, di- or tri- basic acids, selected from the group consisting of dithionic acid, sulfoxylic acid, formic acid, propionic acid, lactic acid, benzoic acid, ethylenediaminetetraacetic acid, maleic acid, citric acid, malonic acid, succinic acid, malic acid, adipic acid, and fumaric acid, wherein said ammonia control component has a dissociation constant, pK_a, less than the corresponding dissociation constant of aqueous ammonia.

4,405,355
N-ALKYL OR ALKOXY-N'-SUBSTITUTED HYDROCARBYL UREA

Malcolm S. Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 68,039, Aug. 20, 1979, Pat. No. 4,273,572, which is a division of Ser. No. 919,016, Jun. 26, 1978, Pat. No. 4,200,450, which is a division of Ser. No. 741,422, Nov. 12, 1976, Pat. No. 4,111,683, which is a continuation-in-part of Ser. No. 591,058, Jun. 27, 1975, abandoned, which is a continuation of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, Mar. 16, 1971, abandoned, and Ser. No. 124,423, Mar. 16, 1971, abandoned.
This application Jan. 26, 1981, Ser. No. 228,395
Int. Cl.³ A01N 57/20; C07F 9/40
U.S. Cl. 71—86 **10 Claims**

1. A compound of the formula



wherein R is an aliphatic hydrocarbyl group of 1 to 12 carbon atoms substituted with 0 to 4 halogen atoms of atomic numbers 17 to 35, an alicyclic hydrocarbyl group of 3 to 8 carbon atoms substituted with 0 to 4 halogen atoms of atomic numbers 17 to 35, an aryl group of 6 to 12 carbon atoms substituted with 0 to 5 halogen atoms of atomic numbers 9 to 35, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, or 0 to 1 alkylsulfoxy of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, phenoxy, phenylthio, phenylsulfoxy, phenylsulfonyl, the phenoxy, phenylthio, phenylsulfoxy or phenylsulfonyl being substituted on the aromatic nucleus with 0 to 5 halogens of atomic numbers 9 to 35 or alkyl of 1 to 4 carbon atoms; or a heterocyclic group selected from the group consisting the thiazolyl, pyridyl, pyrimidyl, oxazolyl, isothiazolyl, furyl, and thienyl and wherein said heterocyclic group is attached to the urea nitrogen via a carbon atom; R^1 is hydrogen or alkyl or 1 to 4 carbon atoms; R^2 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; a is 0 to 1; R^4 is hydrogen or CW_3' wherein W' is hydrogen or halogen of atomic numbers 9 to 35; Z is halogen of atomic numbers 9 to 35; and R^6 is alkyl of 1 to 4 carbon atoms.

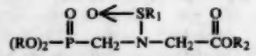
8. An herbicidal composition comprising an herbicidally effective amount of the compound of claim **1** and a biologically inert carrier.

4,405,356
ESTER DERIVATIVES OF N-ARYLSULFINYL-N-PHOSPHONOMETHYLGLYCINATES AS HERBICIDES

James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

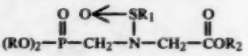
Filed Aug. 31, 1981, Ser. No. 298,057
Int. Cl.³ A01N 57/22; C07F 9/40
U.S. Cl. 71—87 **27 Claims**

1. A method of controlling undesired plants which comprises contacting said plants or plant growth medium with a herbicidally effective amount of a compound of the formula



wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and methylenedioxy, R_1 is independently phenyl or phenyl substituted with from one to three substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl, cyano and nitro and wherein R_2 is lower alkyl or araloweralkyl.

10. A compound of the formula



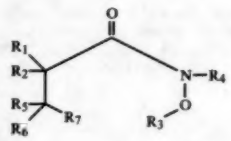
wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, methylenedioxy; R_1 is independently phenyl or phenyl substituted with from one to three substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl, cyano, nitro and halogen and wherein R_2 is lower alkyl or araloweralkyl.

4,405,357
HERBICIDAL 3-ISOXAZOLIDINONES AND HYDROXAMIC ACIDS

Jun H. Chang, Lockport, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 155,353, Jun. 2, 1980, abandoned. This application May 11, 1981, Ser. No. 262,715
Int. Cl.³ A01N 43/00
U.S. Cl. 71—88 **36 Claims**

1. A compound of the formula



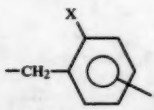
in which

R_1 and R_2 are independently methyl or ethyl;

R_3 is hydrogen, tetrahydropyranyl, tert-butyl-dimethylsilyl, arylsulfonyl, or

in which R_8 is C_1–C_6 alkyl, haloalkyl, phenyl, methylphenyl, nitrophenyl, chlorophenyl, trifluoromethylphenyl, alkylamino, phenylamino, methylphenylamino, methoxyphenylamino, halophenylamino, trifluoromethylphenylamino, alkoxy, haloalkoxy, phenoxy, dichlorophenoxyalkyl, alkylthio, or R_3 with R_7 comprises a single carbon-oxygen bond, forming a ring structure;

R_4 is



in which X is hydrogen, methyl, chlorine, bromine, fluorine, iodine, Y is chlorine, bromine, fluorine, cyano, methoxy, 4,5-methylenedioxy, and n is 0, 1, or 2;

R_5 is hydrogen, chlorine, bromine, phenylamino, or —OR_9 in which R_9 is hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl up to 6 carbons, benzyl, C_2–C_4 acyl, haloacyl, benzoyl, alkylcarbamoyl, phenylcarbamoyl, with the proviso that when R_3 with R_7 does not comprise a single carbon-oxygen bond, R_5 is limited to hydrogen or chlorine.

R_6 is hydrogen;

R_7 is hydrogen, chlorine, bromine, methylthio, acetoxy, benzoyloxy, or R_7 with R_3 comprises a single carbon-oxygen bond, forming a ring structure.

28. A method of controlling undesired plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim **1**.

4,405,358

ARALKYLANILINE DERIVATIVES, AND HERBICIDES WHICH CONTAIN THESE COMPOUNDS

Ulrich Schirmer, Heidelberg; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

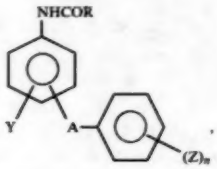
Filed May 1, 1981, Ser. No. 259,618

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020784

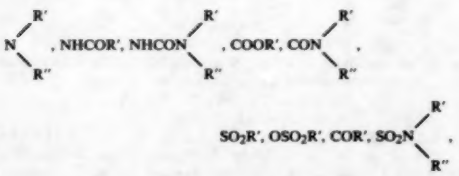
Int. Cl.[3] **A01N** *9/12, 9/14, 9/16, 9/20;* **C07C** *103/34, 69/76*

U.S. Cl. 71—98 **3 Claims**

1. An aralkylaniline derivative of the formula

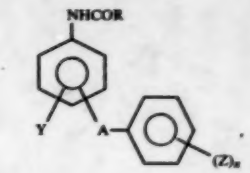


where R is alkoxy, cycloalkoxy, alkenyloxy, alkynyloxy, cyanoalkoxy, haloalkoxy, alkylthio, alkenylthio or alkynylthio or unsubstituted or halogen-, or cyano-substituted ethyl, isopropyl, n-propyl, n-butyl, sec-butyl, tert-butyl, isobutyl, sec-pentyl, cycloalkyl, alkenyl or alkynyl, Y is hydrogen, alkyl, halogen, alkoxy or haloalkyl, A is unsubstituted or alkyl-substituted alkylene which is attached at the 3- or 4-position of the phenyl radical, Z is hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, aralkyl, aryl, aryloxy, halogen, a C_4H_4-chain which is fused to the benzene radical to form an unsubstituted or substituted naphthyl radical, alkoxy, haloalkoxy, alkylthio, thiocyanato, cyano,

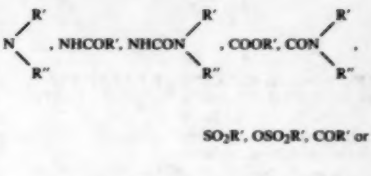


R′ and R″ each, independently of one another, being hydrogen, alkyl, alkoxy, alkylthio, cycloalkyl or unsubstituted or alkyl-, halogen- or alkoxy-substituted phenyl, and n is an integer from 1 to 4.

2. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with an effective herbicidal amount of an aralkylaniline derivative of the formula



where R is alkoxy, cycloalkoxy, alkenyloxy, alkynyloxy, cyanoalkoxy, haloalkoxy, alkylthio, alkenylthio or alkynylthio or unsubstituted or halogen-, alkoxy-, alkoxycarbonyl- or cyano-substituted alkyl, cycloalkyl, alkenyl or alkynyl, Y is hydrogen, alkyl, halogen, alkoxy or haloalkyl, A is unsubstituted or alkyl-substituted alkylene which is attached at the 3- or 4-position of the phenyl radical, Z is hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, aralkyl, aryl, aryloxy, halogen, a C_4H_4-chain which is fused to the benzene radical to form an unsubstituted or substituted naphthyl radical, alkoxy, haloalkoxy, alkylthio, thiocyanato, cyano,



R′ and R″ each, independently of one another, being hydrogen, alkyl, alkoxy, alkylthio, cycloalkyl or unsubstituted or alkyl-, halogen- or alkoxy-substituted phenyl, and n is an integer from 1 to 4.

4,405,359

ACYCLICACYLAMINOPERFLUOROALKANESULFONANILIDES AND DERIVATIVES THEREOF

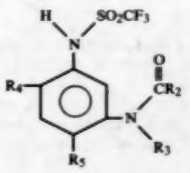
Ezzat A. Mikhail, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 188,538, Sep. 18, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,497

Int. Cl.[3] **C07C** *143/74;* **A01N** *41/06*

U.S. Cl. 71—103 **16 Claims**

1. A compound of the formula



wherein

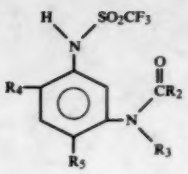
R_2 is carboxyalkyl, carboxyalkenyl, vinyl, dihaloalkenyl;

R_3 is hydrogen;

R_4 is hydrogen, halo, or lower alkyl; and

R_5 is hydrogen, halo, or lower alkyl; and agriculturally acceptable salts thereof; provided that R_2 contains not more than twelve carbon atoms.

6. A compound of the formula



wherein

R_2 is methyl or dichloromethyl;

R_3 is allyl or 2',2',2'-trihaloethyl;

R_4 is hydrogen, halo, or lower alkyl; and

R_5 is hydrogen, halo, or lower alkyl; and agriculturally acceptable salts thereof; provided that R_2 contains not more than twelve carbon atoms.

15. A method for terminating the life cycle of higher plants which comprises contacting said plants with an effective amount of a compound according to claim **6**.

4,405,360

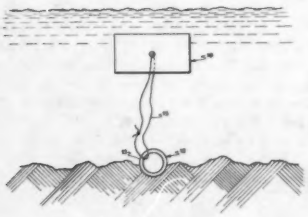
CONTROLLED RELEASE OF HERBICIDE COMPOUNDS UTILIZING A THERMOPLASTIC MATRIX

Nathan F. Cardarelli, Barberton, Ohio, assignor to Environmental Chemicals, Inc., Wauconda, Ill.

Continuation-in-part of Ser. No. 51,102, Jun. 22, 1979, Pat. No. 4,299,613, and Ser. No. 14,118, Feb. 22, 1979, Pat. No. 4,228,614, said Ser. No. 51,102, which is a continuation-in-part of Ser. No. 14,118, which is a continuation-in-part of Ser. No. 5,174, Jan. 22, 1979, Pat. No. 4,237,114, which is a continuation-in-part of Ser. No. 916,570, Jun. 19, 1978, Pat. No. 4,166,111. This application Jul. 24, 1980, Ser. No. 171,834

Int. Cl.³ A01N *37/38*

U.S. Cl. 71—117 **10 Claims**



1. A controlled release herbicide dispenser, comprising:

(a) from about 10 parts to about 160 parts by weight of a herbicide;

(b) from about 15 parts to about 80 parts by weight of an inert porosigen, said porosigen having a solubility of from about 0.0005 to about 100 grams per 100 grams of water; and

(c) about 100 parts of a polymer selected from the group consisting of thermoplastic polymers, thermoset polymers, and combinations thereof;

said herbicide and said porosigen distributed throughout said polymer to form a controlled release herbicide dispenser so that upon contact with moisture or water, said porosigen is dissolved gradually to create a pore structure within the dispenser and, said herbicide is released at a controlled rate to retard and eliminate growth of undesired plants.

4,405,361

METHOD OF INCREASING THE YIELD OF SUGAR OBTAINED FROM SUGAR CANE

Louis G. Nickell, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 365,862, Apr. 5, 1982, abandoned. This application Jan. 3, 1983, Ser. No. 455,180

Int. Cl.³ A01N *33/02*

U.S. Cl. 71—121 **4 Claims**

1. A method of increasing the recoverable sugar contained in sugar cane which comprises contacting the sugar cane plant with an effective amount of the compound, N,N-dimethyl-N-hexadecyl-N-2-propenylammonium bromide.

4,405,362

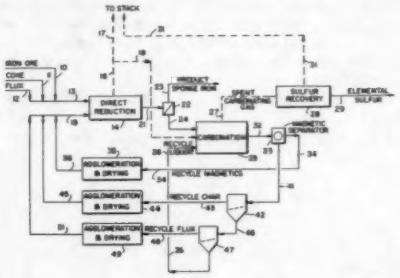
IRON ORE DIRECT REDUCTION WASTE TREATMENT

William V. Bauer, New York, N.Y., assignor to The Lummus Company, Del.

Filed Jul. 28, 1982, Ser. No. 402,716

Int. Cl.³ C21B *13/08*

U.S. Cl. 75—24 **12 Claims**



1. In a process for reducing iron ore in the presence of a carbonaceous reductant and flux wherein there is recovered from the reducing, reduced iron, carbonaceous reductant, and used flux containing calcium oxide, the improvement comprising:

separating reduced iron, as product, from a mixture of carbonaceous reductant and used flux;

carbonating the used flux in said separated mixture as a slurry in an aqueous liquid to decrepitate the used flux and facilitate separation of used flux from carbonaceous reductant

separating the carbonaceous reductant from the carbonated used flux; and

reusing separated carbonaceous reductant as at least a portion of the carbonaceous reductant in reducing the iron ore.

4,405,363

METHOD FOR REFINING OF STEEL MELTS

Bertil G. Tivelius, Viken, Sweden, assignor to Scandinavian Lancers Aktiebolag, Hoganas, Sweden

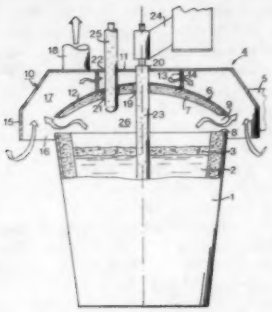
Filed Apr. 12, 1982, Ser. No. 367,796

Int. Cl.³ C21C *7/10*

U.S. Cl. 75—49 **11 Claims**

1. A method for refining steel melts to produce steel of reduced oxygen content, comprising providing a deoxidized steel melt covered by a basic reduced slag in a metallurgic ladle, and injecting at least one member selected from the group consisting of powdered non-oxidic earth alkali metal compound and alloys of said earth alkali metal by means of a non-oxidizing carrier gas into said deoxidized steel melt to oxidize at least a significant amount of the earth alkali metal by oxygen dissolved in the melt to form small particles of earth alkali metal oxide, with a portion of said earth alkali metal separating out to the slag while the remaining portion remains

in the melt in a form selected from the group consisting of the elementary form and the particulate earth alkali metal oxide in colloidal solution form, and thereafter injecting powdered



earth alkali metal oxide into the steel melt to function as nucleus forming agents for the continued reaction between oxygen and earth alkali metal dissolved in the melt, and to separate to the slag smaller inclusions in the melt.

4,405,364

PROCESS OF REFINING IRON IN OXYGEN CONVERTERS WITH ADDITIONS OF MATERIALS CONTAINING SODIUM CARBONATE

Mario Arno', Campi Salentina, and Bruno Costa, Naples, both of Italy, assignors to Nuova Italsider S.p.A., Genoa, Italy

Filed May 17, 1982, Ser. No. 379,082

Claims priority, application Italy, May 20, 1981, 40430 A/81; Feb. 16, 1982, 12439 A/82

Int. Cl.³ C21C *7/00*; C22B *9/10*

U.S. Cl. 75—52 **7 Claims**

1. A process of refining iron to convert iron to steel in an oxygen converter, wherein oxygen is blown into a metallic bath including said iron and slag containing basic compounds selected from CaO, MgO and MnO to desulfurize and dephosphorize the metallic bath, comprising charging sodium carbonate into said metallic bath while blowing oxygen thereto, said sodium carbonate being in the form of brickettes or granules of about 5 to 100 mm. in size, whereby said sodium carbonate is converted to Na_2O in said metallic bath and said Na_2O enhances the desulfurization and dephosphorization of said bath.

4,405,365

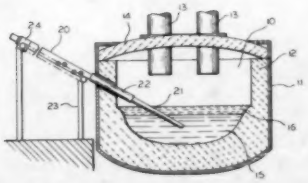
METHOD FOR THE FABRICATION OF SPECIAL STEELS IN METALLURGICAL VESSELS

Edgardo J. Robert, Buenos Aires, Argentina, assignor to Pennsylvania Engineering Corporation, Milwaukee, Wis.

Filed Aug. 30, 1982, Ser. No. 412,552

Int. Cl.³ C21C *5/32*

U.S. Cl. 75—60 **3 Claims**



3. A lance for injecting oxygen into a quantity of molten metal contained in a metallurgical vessel, comprising a hollow holder, a first pipe extending from said holder and being formed of a refractory material,

a second smaller pipe extending from said holder and disposed concentrically within said first pipe and spaced therefrom,

a first inlet pipe extending through said holder and connected to the gap between said first and second pipes for delivering a hydrocarbon fluid thereto,

a second pipe extending through said holder and connected to the interior of the inner pipe for delivering an argon-oxygen mixture thereto, and

inlet and outlet water pipes connected to the hollow interior of said holder for circulating cooling water therethrough.

4,405,366

METHOD AND DEVICE FOR GENERATING A CONVECTIVE REACTION SYSTEM BETWEEN A REACTION AGENT AND A MOLTEN BATH

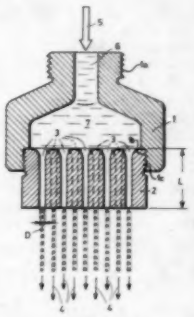
Friedrich W. Guttmann, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Continuation of Ser. No. 144,274, Apr. 28, 1980. This application Jun. 24, 1981, Ser. No. 276,837

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924761

Int. Cl.³ C22B *9/00*

U.S. Cl. 75—93 E **18 Claims**



1. In a method for generating a spatially-limited convective reaction system between a reaction agent and a molten metal bath, the improvement comprising the step of:

forming and applying liquid droplets, in a freely falling stream, as a liquid reaction agent so that at least a portion of the droplets penetrate into the surface of the molten bath to interact with the molten metal.

4,405,367

CORROSION-RESISTANT CAST IRON

Anatoly A. Sheiko; Mikhail V. Voloschenko; Vladimir P. Latenko, all of Kiev; Gennady R. Kartashevsky, Kishenev; Evgeny I. Schegolkov; Anatoly D. Zlatkis, both of Moscow; Viktor G. Osokin, Moskovskaya; Lev V. Polyakov, Moscow; Valentin V. Zaitsev, Strasheny, and Mikhail B. Trunov, Lipetskaya, all of U.S.S.R., assignors to Institut Problem Litya Akademii Nauk Ukrainskoi SSR, Kiev and Otdelnoe Konstruktorskoe Bjuro Besshtangovykh Nassosov, Moscow, both of, U.S.S.R.

Filed Jun. 23, 1982, Ser. No. 391,252

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **4 Claims**

1. Corrosion resistant cast iron consisting essentially of (by mass %):

carbon	2.5 to 3.2

-continued

silicon	0.95 to 2.4
manganese	0.8 to 4.0
nickel	12.0 to 18.0
chromium	0.5 to 2.0
copper	4.0 to 8.0
aluminium	0.001 to 0.3
magnesium	0.01 to 0.07
calcium	0.01 to 0.10
rare-earth metals	0.00. to 0.08
barium	0.01 to 0.1
tantalum	0.003 to 0.02
niobium	0.005 to 0.3
cobalt	0 to 0.3
titanium	0 to 0.5
iron	balance

4,405,368

IRON-ALUMINUM ALLOYS CONTAINING BORON WHICH HAVE BEEN PROCESSED BY RAPID SOLIDIFICATION PROCESS AND METHOD

Ranjan Ray, Waltham; Viswanathan Panchanathan, Billerica, and Bill C. Giessen, Cambridge, all of Mass., assignors to Marko Materials, Inc., No. Billerica, Mass.

Filed May 7, 1981, Ser. No. 261,626
Int. Cl.³ F16H *29/10*
U.S. Cl. 75—124 8 Claims

1. A metastable crystalline solid solution alloy of composition $Fe_aAl_bM_d{}^1Si_cB_f$ where M^1 is at least one element selected from the group consisting of Mo,W,Nb,Ta, and V and combinations thereof, wherein the subscripts represent atom percent having the values a=40–65, b=20–40, d=0–10, e=0–5, and f=5–17 with the provisos that the sum of e+f does not exceed 17 and is not less than 7 and the sum of a+b+d+e+f is 100, wherein the said alloy is being prepared by the method comprising the following steps:

a. forming a melt of said alloy

b. depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately 10^5 to $10^{7°}$ C./second and form thereby a rapidly solidified brittle strip and,

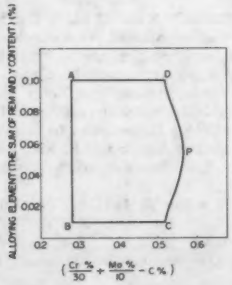
c. comminuting said strip into powders.

4,405,369

FERRITIC HEAT-RESISTING STEEL WITH AN EXCELLENT TOUGHNESS

Yasuo Otoguro, Machida; Katukuni Hashimoto, Sagamihara; Hisashi Takahashi, and Toshio Fujita, both of Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,397
Claims priority, application Japan, Jul. 30, 1980, 55-104779
Int. Cl.³ C22C *38/22, 38/24, 38/26*
U.S. Cl. 75—126 C 9 Claims



1. A ferritic heat-resisting steel having a carbon content lowered to not more than 0.10% by weight so as to provide the steel with weldability and formability that is enhanced as compared to it having higher carbon content, and containing carbide particles which are controlled so as to provide the steel with the mechanical and creep strength of said steel of higher carbon content and having a toughening alloying element giving the steel greater toughness than it has without said element, said steel consisting essentially of the following:

0.03 to 0.10% by weight of carbon,

0.1 to 1.0% by weight of silicon,

1.5% by weight or less of manganese,

1.5% to 2.7% by weight of molybdenum,

7.0% to 10.0% by weight of chromium,

0.01 to 0.1% by weight of niobium,

0.02 to 0.12% by weight of vanadium,

0.01 to 0.10% by weight of said toughening alloying element and which consists of at least one member selected from the group consisting of rare earth elements having atomic numbers 57 through 71 and yttrium,

the balance of the steel consisting of iron and unavoidable impurities, the ratio of the sum of the numbers of niobium and vanadium atoms to the number of carbon atoms being in the range of from 0.35 to 0.80; and the quantity (Cr%/30+Mo%/10−C%) and the content in percent of said alloying element falling on or within an irregular pentagon shown in FIG. 1 hereof, said irregular pentagon being defined by points of A, B, C, P and D,

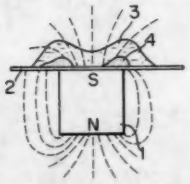
Coordinate	$\left(\frac{Cr\ \%}{30} + \frac{Mo\ \%}{10} - C\ \%\right)$	Alloying element (The Sum of REM and Y content) (%)
A	0.28	0.10
B	0.28	0.01
C	0.52	0.01
P	0.57	0.055
D	0.52	0.10

4,405,370

MAGNETIC INK REFINING METHOD

Mamoru Soga, Osaka; Wataru Shimotsuma, Ibaraki; Yoshio Kishimoto, Hirakata, and Yoichi Sekine, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1981, Ser. No. 264,562
Claims priority, application Japan, May 20, 1980, 55-67648; Jul. 28, 1980, 55-103935
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—20 3 Claims



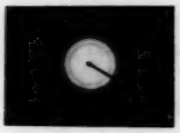
1. A method for refining a magnetic ink containing unstable fine magnetic particles dispersed in a despersing medium in a colloidal state with a surface-active agent comprising settling said unstable particles and removing same by applying a concentrated magnetic field to the ink.

4,405,371

NOVEL CLAY MINERAL COLOR DEVELOPER FOR PRESSURE SENSITIVE RECORDING PAPER AND PROCESS FOR PRODUCING SAME

Yujiro Sugahara, deceased, late of Tokyo, Japan (by Mitsuko Sugahara, Yoshiyuki Sugahara, heirs); Koichi Usui, Shibata, Japan; Masahide Ogawa, Shibata, Japan; Teiji Sato, Shibata, Japan; Yasuo Mizoguchi, Shibata, Japan, and Seiji Kojima, Nakajyo, Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1981, Ser. No. 279,191
Claims priority, application Japan, Jul. 3, 1980, 55/89989
Int. Cl.³ C09D 11/00
U.S. Cl. 106—21 20 Claims



1. A process for producing a color developer for pressure sensitive recording paper which comprises (1) acid-treating a clay mineral having a layer-structure composed of regular tetrahedrons of silica until its SiO_2 content reaches 82–96.5% by weight on dry basis (drying at 105° C. for 3 hours), and until both the X-ray diffraction analysis and electron diffraction analysis come to show substantially no diffraction pattern attributable to the crystals of layer-structure composed of regular tetrahedrons of silica possessed by the clay mineral before the acid treatment, and (2) contacting the resulting clay mineral, in an aqueous medium, with at least one member selected from the group consisting of a magnesium compound and an aluminum compound which is at least partially soluble in said aqueous medium, neutralizing the system with an alkali or an acid to form hydroxide when the soluble compound or compounds employed are other than hydroxides, thereby introducing into the acid-treated clay mineral at least one of a magnesium component and an aluminum component, and forming a clay mineral having a layer-structure composed of regular tetrahedrons of silica and which shows

(A) the diffraction pattern attributable to the crystals of layer-structure composed of regular tetrahedrons of silica when subjected to an electron diffraction analysis, but

(B) substantially no diffraction pattern attributable to the crystals of said layer-structure when subjected to an X-ray diffraction analysis, and which

(C) contains as the constituting elements besides oxygen, silicon and at least one of magnesium and aluminum.

4,405,372

GYPSUM-FREE CEMENT COMPOSITIONS

Frank G. Serafin, Peabody; Robert W. Previte, Lawrence, both of Mass.; Nathan R. Greening, Ft. Collins, Colo.; David L. Kantro, Aurora, Ohio, and Fulvio J. Tang, Mundelein, Ill., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Mar. 8, 1982, Ser. No. 355,486
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 17 Claims

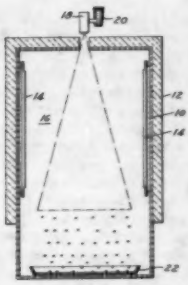
1. A gypsum-free cement composition exhibiting a compressive strength comparable to ordinary portland cement containing gypsum, and with setting properties which can be regulated, said composition comprising a portland cement clinker having from 1 to 10 weight % of limestone interground therewith to exhibit a specific surface area of from 3000 to 7000 cm^2/g, and a water-soluble amine salt in an amount of from 0.005 to 1% by weight of said clinker, said salt formed by reaction between an amine and formic or acetic acid.

4,405,373

METHOD OF ALTERING THE EFFECTIVE BULK DENSITY OF SOLID MATERIAL AND THE RESULTING PRODUCT

Lawrence B. Kool; Robert L. Nolen, and David E. Solomon, all of Ann Arbor, Mich., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Dec. 21, 1979, Ser. No. 106,132
Int. Cl.³ C08L 1/08; C08J 3/04
U.S. Cl. 106—198 5 Claims



1. A method of suspending a solid material having a predetermined first bulk density in a carrier fluid having a second bulk density substantially less than said first bulk density comprising the steps of:

(a) forming a solution at preselected concentration comprising said solid material in powdered form, a film-forming polymer and a solvent in which said polymer is soluble,

(b) forming said solution into droplets of predetermined nominal size,

(c) forming said droplets into hollow spherical shells having a bulk density which is substantially equal to said second bulk density by spraying said solution in droplet form into the upper portion of a zone heated at atmospheric pressure to a preselected temperature such that said solvent evaporates as said droplets fall by gravity through said zone and said film-forming polymer forms said hollow spherical shells each having a shell wall in which said solid material is captured and having a said shell bulk density which is a function of said preselected concentration, said predetermined nominal droplet size and said preselected temperature, and then

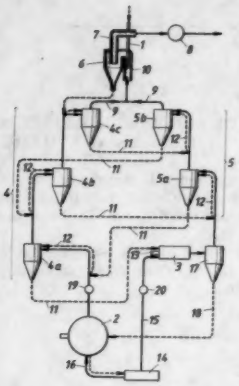
(d) suspending said spherical shells with said solid material captured in said shell walls in said carrier fluid.

4,405,374

PROCESS OF PRODUCING CEMENT AND PLANT FOR CARRYING OUT THE PROCESS

Franz Krennbauer, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Mar. 26, 1982, Ser. No. 362,499
Claims priority, application Austria, Apr. 15, 1981, 1707/81
Int. Cl.³ C04B 7/44
U.S. Cl. 106—100 4 Claims



1. In a process of producing cement, wherein
a powdered raw materials mixture is de-acidified in a calcinator and is subsequently burned in a kiln and before being fed to said calcinator is preheated in a plurality of stages by a heat exchange with exhaust gases from said calcinator and from said kiln in a heat exchanger in which said heat exhaust gases from said calcinator and from said kiln flow through respective parallel series of heat exchange stages and said powdered raw materials mixture is passed from heat exchange stages of each of said series to associated heat exchange stages of the other of said series,
the improvement residing in that
said exhaust gases from said calcinator and from said kiln which have flown through said respective series are combined and then passed through an additional heat exchange stage, which the last heat exchange stage in the flow path of the exhaust gases and is fed with said powdered raw materials mixture before said mixture is fed to the heat exchange stages of said two series in alternation.

4,405,375

NIYUMINOUZBITUMINOUS EMULSION ROOF RESATURANT

Richard J. Gibson, North Olmstead, and Joseph Fogel, University Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 21, 1980, Ser. No. 151,869
Int. Cl.³ C08L 95/00
U.S. Cl. 106—277 5 Claims

1. A bituminous emulsion roof resaturant for application over an existing roof surface, said bituminous emulsion roof resaturant comprising a water phase and an oil phase suspended in particulate form in said water phase, said water phase containing:
(a) water,
(b) an emulsifier selected from the group consisting of hydroxypropyl methylcellulose, a partially acetylated polyvinyl alcohol or a combination of hydroxypropyl methylcellulose and a partially acetylated polyvinyl alcohol, and
(c) from about 0.1 to 2.0 parts by weight of glyoxal per 100 parts by weight of water,
said oil phase comprising a blend of bitumen and aromatic hydrocarbons with at least 50 percent by weight of said blend being aromatic hydrocarbons, said bitumen having a load penetration measured according to ASTM Designation D5 with a 50 gram load at 25° C. for 5 seconds of from 30 to 170, a softening point measured according to ASTM Designation D36 of from 32° C. to 45° C., a flash point measured according to ASTM Designation D92 above 260° C., ductility at 25° C. measured according to ASTM Designation D113 in excess of 50 centimeters, solubility in carbon tetrachloride of at least 99 percent, and a maximum heat loss measured at 163° C. according to ASTM Designation D6 of one percent, said roof resaturant comprising from 50 to 70 percent by weight of said oil phase and from 30 to 50 percent by weight of said water phase.

4,405,376

TITANIUM DIOXIDE PIGMENT AND PROCESS FOR PRODUCING SAME

Mamoru Matsunaga; Teruo Usami; Haruo Okuda, and Hideo Futamata, all of Yokkaichi, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Nov. 16, 1981, Ser. No. 321,706
Claims priority, application Japan, Nov. 18, 1980, 55-162373
Int. Cl.³ C09C 1/36
U.S. Cl. 106—300 22 Claims

1. A titanium dioxide pigment which consists of either (A) (1) pigmentary titanium dioxide core particle, (2) an inner coating formed of 0.1–3% by weight, based on the weight of said core particle and calculated as SnO_2, of hydrous tin oxide and 0.1–5% by weight, based on the weight of said core particle and calculated as ZrO_2, of hydrous zirconium oxide and (3) an outer coating formed of 0.1–8% by weight, based on the weight of said core particle and calculated as Al_2O_3, of hydrous aluminum oxide or (B) (1), (2), (3) and a coating of an organic agent adsorbed around the outer coating of hydrous aluminum oxide, said pigment having a high photochemical durability and excellent gloss and dispersibility.

12. A process for producing a titanium dioxide pigment which consists of (1) forming an aqueous slurry of pigmentary titanium dioxide core particles, (2) adding, to said slurry, water soluble compounds of tin and zirconium and adding an acid or an alkali for neutralizing said slurry to pH 6–8 to precipitate hydrous oxides of tin and zirconium on the surfaces of said core particles, thereby forming an inner coating consisting of 0.1–3% by weight of tin oxide and 0.1–5% by weight of zirconium oxide, both based on the weight of said core particles and calculated as SnO_2 and ZrO_2, respectively, and then (3) adding a water soluble compound of aluminum and adding an acid or an alkali for neutralizing said slurry to pH 6–8 to precipitate hydrous aluminum oxide, thereby forming an outer coating consisting of 0.1–8% by weight of aluminum oxide, based on the weight of said core particles and calculated as Al_2O_3 or after (3) adsorbing an organic agent thereon.

4,405,377

PROCESS FOR THE SEPARATION OF MONOSACCHARIDES

Richard W. Neuzil, Downers Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 10, 1982, Ser. No. 347,661
Int. Cl.³ C13D 3/12
U.S. Cl. 127—46.2 8 Claims

1. In a process for the separation of a first monosaccharide from a feed mixture comprising an aqueous solution of a mixture of said first monosaccharide and at least one other monosaccharide by contacting said solution at adsorption conditions with an adsorbent comprising a crystalline aluminosilicate exhibiting an adsorptive selectivity towards said first monosaccharide, thereby selectively adsorbing said first monosaccharide from said mixture, and thereafter recovering said adsorbed monosaccharide, the improvement which comprises diluting said feed mixture prior to said contacting with sufficient ethanol to result in a solution containing from about 10 vol. %

ethanol to slightly less than the concentration of ethanol that would cause crystallization of a monosaccharide from said solution.

4,405,378

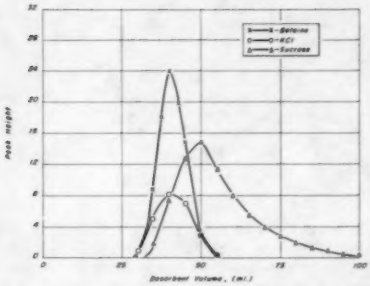
EXTRACTION OF SUCROSE

Santi Kulprathipanja, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 235,063, Feb. 17, 1981, abandoned. This application Sep. 28, 1981, Ser. No. 306,262

Int. Cl.³ C13D *3/12*

U.S. Cl. 127—55 **11 Claims**



1. A process for separating sucrose from an aqueous solution containing sucrose and at least one of the compounds selected from the group consisting of betaine and a mineral salt, which process comprises:

(a) contacting said solution, at adsorption conditions, with an adsorbent comprising activated carbon powder bound with a binder material consisting essentially of a water permeable organic polymer selected from the group consisting of a cellulose nitrate, a cellulose ester and a mixture of a cellulose nitrate and cellulose ester, thereby selectively adsorbing said sucrose thereon; and

(b) separating the solution from contact with said adsorbent, wherein the solution still contains said at least one of the compounds selected from the group consisting of betaine and a mineral salt;

and thereafter recovering said sucrose by desorption thereof from said adsorbent.

4,405,379

METHOD FOR CLEANING METAL PARTS

Jack W. Chasteen, Kettering, Ohio, assignor to University of Dayton, Dayton, Ohio

Continuation-in-part of Ser. No. 119,060, Feb. 6, 1980, Pat. No. 4,324,594, and Ser. No. 119,061, Feb. 6, 1980, Pat. No. 4,328,044, each is a continuation-in-part of Ser. No. 874,915, Feb. 2, 1978, Pat. No. 4,188,237. This application Oct. 26, 1981, Ser. No. 314,594

Int. Cl.³ B08B *5/00;* **C23G** *5/00*

U.S. Cl. 134—2 **16 Claims**

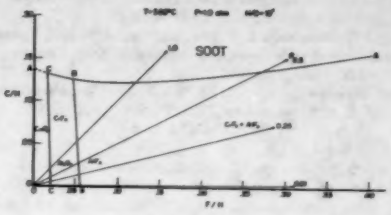
1. A method for cleaning unbrazable metal parts to render them brazable or otherwise bondable which comprises:

(a) placing said part in a hermetically sealed chamber,

(b) subjecting said part to a gaseous atmosphere, said atmosphere containing the elements C, O, H and F and having an H/O ratio of 10^4 or greater and a C/F ratio of about 0.01 to less than 2.0,

(c) raising the temperature of said chamber to a temperature less than 800° C. and establishing a F/H ratio in said atmosphere at which passivating oxides on the surface of said part are converted to fluorides,

(d) raising the temperature of said chamber above the temperature employed in step (c) to a temperature less than 1000° C. and diluting said atmosphere with additional



hydrogen to destabilize CrF_3 on the surface to elemental chromium,

(e) cooling said chamber and said part.

4,405,380

HIGH STRENGTH, LOW ALLOY STEEL WITH IMPROVED SURFACE AND MECHANICAL PROPERTIES

Cecil B. Griffith, North Royalton; Jerry D. Thomas, North Olmsted; Dionisyj W. Demianczuk, Parma; John K. Abraham, Broadview Heights, and Joseph E. Franklin, Medina, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 105,735, Dec. 20, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,914

Int. Cl.³ C22C *38/12*

U.S. Cl. 148—2 **18 Claims**

1. A high strength steel product consisting of hot rolled strip having a thickness of 0.05 to 0.5 inch produced by hot rolling to a deformation of at least 50% and as so produced having a yield strength of at least 50 ksi and bendability, without cracking, of essentially zero inside radius of bend over essentially 180°, said product consisting of a skin of rimmed steel which is essentially ferrite and has a thickness of about 0.001 to 0.01 inch, over the principal surface area of the product and beneath said skin a core of aluminum-killed steel, the steel of said skin and core being free of sulfide shape control elements and consisting essentially of 0.03 to 0.06% C, 0.2 to 0.6% Mn, 0.045 max. % P, less than 0.025% S, balance iron and incidental elements, said core also containing the following elements: 0 to 0.20% Ti, 0.02 to 0.2% Al, 0.01 to 0.15% Cb and 0 to 0.20% V.

8. A method of making a hot rolled, high strength, low alloy steel product consisting of hot rolled strip having a thickness of 0.05 to 0.5 inch, comprising pouring an ingot mold 80% to 95% full of molten steel which is free of sulfide shape control elements and consists essentially of 0.03 to 0.06% C, 0.2 to 0.6% Mn, 0.045 max. % P, less than 0.025% S, balance iron and incidental elements, allowing said filling to undergo rimming action while a shell of rimmed steel about one inch to four inches thick solidifies next to the mold surround a still-molten core, and then completing pouring of said molten steel into said ingot mold while adding to the molten steel in the mold, aluminum to provide 0.02 to 0.20% Al in the finished core and thereby to kill said core, and 0.01 to 0.15% Cb and 0 to 0.20% V in the core; and after solidification of the ingot, converting the same by hot rolling, to a hot reduced strip product having a skin of rimmed steel which is essentially ferrite and has a thickness of about 0.001 to 0.01 inch, over the principal surface area of the product, and beneath the skin a core of aluminum-killed steel, said hot rolled strip product having bendability, without cracking, of essentially zero inside radius of bend over essentially 180°.

4,405,381

STEEL PRODUCTS SUCH AS BARS, COMPOSITIONALLY NON-RIMMING AND INTERNALLY ALUMINUM KILLED, HAVING GOOD SURFACE CONDITION

Dionisyj W. Demianczuk, Parma, and Carl J. Bingel, Fairview Park, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 121,879, Feb. 15, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,637

Int. Cl.³ C21D 8/06

U.S. Cl. 148—7 5 Claims

1. A non-rimming steel bar product that has been shaped by rolling deformation and that has a non-rimmed steel skin over its principal surface, said skin having a partially killed composition consisting essentially of 0.18 to 0.45% C, 0.3 to 1.75% Mn, 0.04 max. % P, 0.045 max. % S, 0 to 2.0% Ni, 0 to 1.0% Cr, 0 to 0.5% Mo, balance iron and incidental elements, said partially killed composition being sufficiently deoxidized by inclusion of material of the class consisting of silicon and aluminum to prevent formation of blow holes at or in said skin, said included material being present in an amount of not more than 0.15% Si or 0.010 Al insufficient to constitute the composition as killed steel, and a core of non-rimming steel under said skin which is aluminum-treated to be killed or grain refined and which consists essentially of the aforesaid composition plus other material to provide 0.02 to 0.5% Al, 0 to 0.5% Si, 0.40 max. % S, 0 to 2.0% Cu, 0 to 0.05% B, 0 to 0.2% P, 0 to 0.15% Cb, 0 to 0.3% V, 0 to 0.4% Ti, 0 to 0.05% rare earth elements, said bar product being produced by rolling from an ingot having a surrounding layer ¼ to 4 inches thick which has the first-mentioned partially killed composition and the aforesaid skin of said bar product derived from said layer being 0.001 to 0.100 inch thick.

4,405,382

SCARFING BURNER ARRANGEMENT

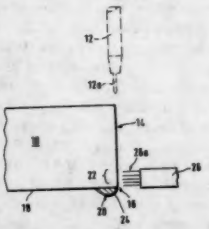
Alfred Baier, Kronberg; Alfred Lucht, Bickenbach; Gerhard Munch, Frankfurt, and Alfred Pfeuffer, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,218

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136023

Int. Cl.³ B23K 7/02

U.S. Cl. 148—9 R 6 Claims



1. In an arrangement of a scarfing burner for removing the slag bed produced during flame cutting of a workpiece, the improvement being in that the scarfing burner is directed only towards the cut surface of the flame-cut workpiece.

4,405,383

METHOD AND APPARATUS FOR A SURFACE STRIPPING TREATMENT OF OBJECTS CONSISTING OF IRON WITH A HIGH CARBON CONTENT

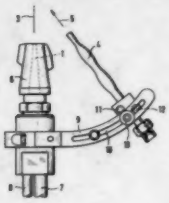
Egon Evertz, Solingen, and Helmut Rahn, Dortmund, both of Fed. Rep. of Germany, assignors to Evon Evertz, Solingen, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,745

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047158

Int. Cl.³ B23K 7/06

U.S. Cl. 148—9.5 12 Claims



1. A method for a surface-stripping treatment of objects consisting of iron with a high carbon content such as cast iron, spheroidal graphite iron and pig iron wherein a flame which is formed by combustion of a heating gas with oxygen is directed at the surface which is to be stripped, the flame producing a molten pool of metal at the point of flame impingement and being conducted linearly across the entire surface for linear localised propagation of the melt and its removal, characterised in that in the impingement zone of the flame jet a gas which flows at a slower velocity than the heating gas and the oxygen and which reacts endothermically with at least one component of the flame gases and thereby absorbs heat, is also applied to the surface of the object.

4,405,384

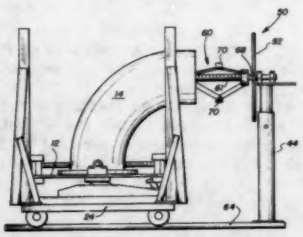
METHOD AND APPARATUS FOR SALVAGING LARGE PIPE ELBOWS

George W. Tucker, Rte. 13, Box 276, Fort Worth, Tex. 76119

Filed Sep. 30, 1982, Ser. No. 431,110

Int. Cl.³ B23K 7/04

U.S. Cl. 148—9.6 5 Claims



1. The method of re-claiming used or damaged tube turns and rendering them equivalent to new tube turns with correctly oriented openings, comprising the steps of:

(a) temporarily fixing a tube turn in a position such that the longitudinal axis of one of its ends is perpendicular to the plane of an adjacent circular track, and such that the opening of said end is near said circular track;

(b) centering the circular track with respect to the adjacent opening; and

(c) causing a cutting torch to translate around the circular

track so as to define a circular cutting path, and the torch being oriented such that some material is cut off the tube and a fresh edge is produced on the tube end when the cutting torch makes an excursion around the track.

4,405,385

PROCESS OF TREATMENT OF A PRECIPITATION HARDENABLE AL-MG-SI-ALLOY

Leo Cloostermans-Huwaert, Maarkedal, Belgium, assignor to Societe Franco-Belge des Laminoirs et Trefileries d'Anvers "Lamitreff", Hemiksem, Belgium

Continuation-in-part of Ser. No. 103,745, Dec. 14, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,226
Claims priority, application Luxembourg, Dec. 14, 1978, 80656
Int. Cl.³ C22F 1/04
U.S. Cl. 148—11.5 A 13 Claims

1. A process for shaping of a precipitation hardenable Al-Mg-Si alloy into wire rod suitable as starting material for drawing into electrical conductor wire and having a minimum strength of at least about 23 Kg/mm² and minimum conductivity of at least about 52% IACS in the as-rolled, unaged condition, which process comprises:

(a) submitting the alloy to a rapid preliminary cooling-down step from a temperature of substanital solubility of the alloying elements towards a temperature inside the range of semi-hot temperatures, and

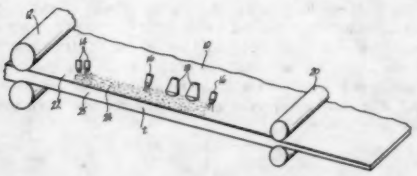
(b) then rolling said alloy immediately thereafter whilst rapidly cooling down from said temperature inside the range of semi-hot temperatures towards a temperature at the exit of the rolling-mill, this temperature being at least 140° C. and not higher than 200° C., this step being sufficiently short to avoid the formation of precipitates of a dimension of more than 1 micron.

4,405,386

PROCESS AND APPARATUS FOR IMPROVING COLD ROLLABILITY AND/OR STRIP ANNEALABILITY OF METALS AND METAL ALLOYS

Brian Mravic, North Haven, and Eugene Shapiro, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 5, 1982, Ser. No. 365,726
Int. Cl.³ C21D 8/02; C22F 1/08, 1/04
U.S. Cl. 148—11.5 A 26 Claims



1. Process for improving the cold rollability of a strip material, said process comprising:

providing a metal or metal alloy strip material having an initial thickness;

cold working said strip material to obtain a desired reduction in said thickness;

selectively heating edge and near-edge portions of said material without significantly annealing the bulk of said strip material to increase the ductility of the material at said portions and the amount of reduction that can be taken before the onset of significant edge cracking; and

further cold working said strip material,

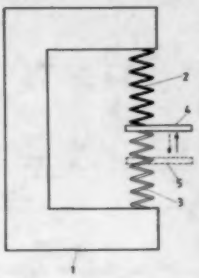
whereby said increased ductility at said portions and amount of reduction that can be taken permit the total reduction taken in said strip material before full annealing is required to be maximized.

4,405,387

PROCESS TO PRODUCE A REVERSIBLE TWO-WAY SHAPE MEMORY EFFECT IN A COMPONENT MADE FROM A MATERIAL SHOWING A ONE-WAY SHAPE MEMORY EFFECT

Joachim Albrecht, Mülligen; Thomas Duerig, Nussbaumen, and Walter Weber, Zürich, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 27, 1982, Ser. No. 402,230
Claims priority, application Switzerland, Feb. 5, 1982, 704/82
Int. Cl.³ C21D 8/00
U.S. Cl. 148—11.5 R 5 Claims



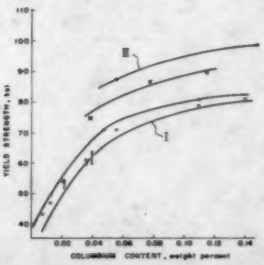
1. A process for inducing a reversible two-way shape memory effect in an already existing component made of a shape memory alloy exhibiting a one-way effect comprising first solution treating said component in a temperature range of β-solid solution, subsequently quenching in water, and then deforming said component under operating conditions by subjecting to an external load said load being applied in the form of a counterweight, a spring, or an additional component rigidly joined to and hindering free movement of said shape memory component provoking an internal stress counteracting said one-way effect.

4,405,388

STRENGTHENING RESPONSE IN COLUMBIUM-CONTAINING HIGH-STRENGTH LOW-ALLOY STEELS

Paul E. Repas, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1982, Ser. No. 365,420
Int. Cl.³ C22C 38/06, 38/12
U.S. Cl. 148—36 7 Claims



1. A hot-rolled, aluminum-killed steel product having a thickness less than 0.40 inches and exhibiting a yield strength in excess of 75 ksi, consisting essentially of 0.01 to 0.10% C, 0.03 to 0.15% Cb in an amount wherein Cb<7.74 times the C content of the steel, 0.30 to 1.20% Mn, 0.02 to 0.15% Al, 0.003

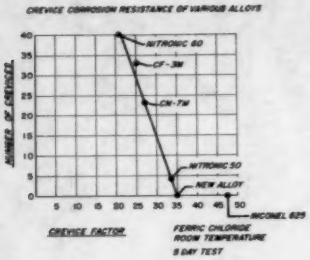
to 0.010% N, 0.010 to 0.045% Ti in an amount ≧3 times the N content of the steel, less than 0.05% Zr, balance Fe.

4,405,389

AUSTENITIC STAINLESS STEEL CASTING ALLOY FOR CORROSIVE APPLICATIONS

John A. Larson, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 21, 1982, Ser. No. 435,699
Int. Cl.³ C22C *38/44*
U.S. Cl. 148—37 **6 Claims**



1. An austenitic stainless steel casting alloy having approximately 10–15 percent ferrite consisting of the following anticipated range of critical elements:

	C	Mn	Si	Ni	Cr	Mo	N	V	P	S
% min.		0.1	0.2	10.0	20.0	3.2	0.10	0.10		
% max.	0.03	0.5	2.0	14.0	23.0	4.5	0.30	0.30	0.04	0.04

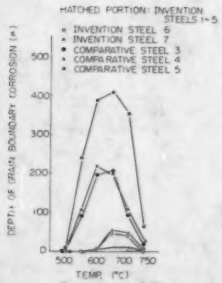
the balance of the material consisting essentially of iron.

4,405,390

HIGH STRENGTH STAINLESS STEEL HAVING EXCELLENT INTERGRANULAR CORROSION CRACKING RESISTANCE AND WORKABILITY

Kazuo Hoshino; Teruo Tanaka, and Keiichi Tachibana, all of Yamaguchi, Japan, assignors to Nisshin Steel Company, Ltd., Japan

Filed Jul. 8, 1982, Ser. No. 396,395
Claims priority, application Japan, Jul. 8, 1981, 56-105673
Int. Cl.³ C22C *38/40*
U.S. Cl. 148—37 **1 Claim**



1. A wrought high strength rolling stock stainless steel material having excellent intergranular corrosion cracking resistance and workability and a composition in % by weight consisting essentially of C: not more than 0.03%, N: 0.04–0.12%, Si: not more than 0.7%, Mn: not more than 1.75%, Ni: 6.0–10.0%, Cr: 16.0–20.0% and balance Fe and impurities inevitably incidental from the steelmaking process, and that the composition is adjusted to have an Aγ value of 19.5–20.5; where:

$$A\gamma=(\%Ni)+0.60(\%Cr)+0.70(\%Mn)+13[(\%C)+(\%N)].$$

4,405,391

HOMOGENEOUS, DUCTILE NICKEL-PALLADIUM BRAZING FOILS

Nicholas J. DeCristofaro, Chatham, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 14, 1981, Ser. No. 224,879
Int. Cl.³ C22C *19/03*
U.S. Cl. 148—403 **4 Claims**

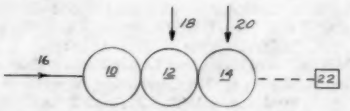
1. A homogeneous, ductile brazing foil composed of metastable material having at least 50 percent glassy structure and a composition consisting essentially of about 1 to 41 atom percent palladium, 0 to about 20 atom percent chromium, 11 to about 20 atom percent boron, and the balance essentially nickel and incidental impurities, wherein the composition is such that the total of nickel, palladium and chromium ranges from about 80 to 89 atom percent.

4,405,392

METHOD OF MAKING PRIMING COMPOSITION

John F. Hobbs, Sutton Coldfield, and Gordon R. Sutcliffe, Hartlebury Nr. Kidderminster, both of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Sep. 3, 1976, Ser. No. 722,070
Claims priority, application United Kingdom, Sep. 11, 1975, 37385/75
Int. Cl.³ D03D *23/00*
U.S. Cl. 149—109.6 **5 Claims**



1. A method of producing in situ a priming composition which comprises a primary explosive selected from the group consisting of styphnates and azides together with at least one other ingredient, said method comprising the step of causing a reaction between components which will react to produce said primary explosive, said reaction occurring in situ with the components in admixture with the remainder of the composition, the reaction also producing a by-product which remains in the composition.

4,405,393

METHOD FOR FORMING A LAYER OF BLOWN CELLULAR URETHANE ON A CARPET BACKING

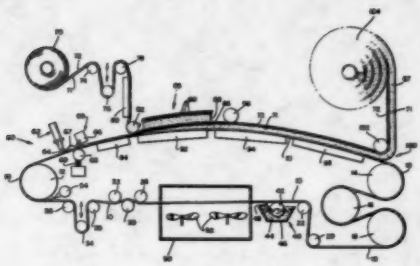
John G. Tillotson, Tiarco Dr., Dalton, Ga. 30720

Continuation of Ser. No. 872,341, Jan. 25, 1978, Pat. No. 4,132,817, which is a continuation-in-part of Ser. No. 782,636, Mar. 30, 1977, Pat. No. 4,171,395. This application Jan. 2, 1979, Ser. No. 478
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.³ B32B *31/00, 5/20*
U.S. Cl. 156—78 **11 Claims**

1. Method of forming a layer of blown cellular urethane on a carpet backing fabric comprising the steps of:

(a) preparing a mixture of reactive urethane forming agents containing sufficient water to cause chemical blowing of the mixture when heated sufficiently and controlling the

temperature of the mixture to a temperature of between about 60° and 100° F.;
(b) providing an endless conveyor belt;
(c) depositing the mixture of reactive urethane forming agents onto the conveyor belt while the temperature of the belt is controlled to a temperature of between about 50° and 100° F.;
(d) preheating the lower surface of an uncoated carpet material to a temperature of between 100° and 300° F.;
(e) preheating the urethane forming mixture to a tempera-



ture of between 90° and 150° F. to cause chemical blowing thereof and then bringing the lower surface of the preheated carpet into flush contact with the preheated urethane forming mixture;
(f) applying pressure to the carpet material while the reactive mixture is undergoing chemical blowing;
(g) heating the urethane forming mixture to a temperature of between 120° and 350° F. after the preheated carpet is brought into flush contact with the mixture; and
(h) stripping the coated carpet material from the conveyor belt.

4,405,394

LAMINATING PROCESS

Abraham B. Cohen, Springfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 153,636, May 27, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,618
Int. Cl.³ B32B *31/02*
U.S. Cl. 156—83 **33 Claims**

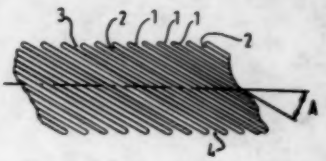
1. In a process for laminating by means of pressure a strippable film supported photosensitive layer to a cleaned nonporous substrate surface consisting essentially of copper or aluminum, the improvement comprising the sequential steps of:
(a) rendering the copper or aluminum substrate surface clean, the cleanliness of the surface being defined by the uniform water film test;
(b) within about 1 minute after rendering the substrate surface clean and immediately prior to lamination, applying a thin layer of liquid to form an interface between the substrate surface and the photosensitive layer;
(c) displacing the thin layer of liquid from the interface by absorption into the photosensitive layer during lamination; and
(d) within 30 seconds after lamination, removing the support for the photosensitive layer without delamination of the photosensitive layer from the substrate by bending the support back along a longitudinal axis of the photosensitive layer.

4,405,395

REINFORCED STRUCTURES

Anthony R. Wright, Nuneaton, England, assignor to W & A Bates Limited, London, England

Filed Oct. 9, 1981, Ser. No. 310,393
Claims priority, application United Kingdom, Oct. 16, 1980, 8033332
Int. Cl.³ B29H *17/00, 9/04;* D04H *3/05*
U.S. Cl. 156—117 **25 Claims**



1. Apparatus for making a tire breaker fabric comprising an elongate sheet of tire cord fabric embedded in elastomer in which the cords extending across the sheet are formed by one single continuous tire cord which extends back and forth across the sheet so that the edges of the sheet are formed by a series of folded cord edges, the apparatus comprising:
(a) a pair of spaced apart edge forming units;
(b) a tire cord laying head for laying one single continuous tire cord in zig-zag formation between said edge forming units;
(c) said tire cord laying head having means to impart a loop to the tire cord at each edge forming unit;
(d) each edge forming unit having one loop holding pin engageable with said looped cord and a pincher head engageable about said holding pin to crimp said looped cord and the pin to form a folded cord edge;
(e) means for releasing each folded cord edge from the associated loop holding pin and transferring the cord extending between the edge forming units to a collector and holding unit to form a cord assembly comprising a plurality of cords the edges of which are formed by folded cord edges;
(f) said collector and holding unit being operable to release the cords of said cord assembly individually; and
(g) means for advancing each released cord to means for applying elastomer to the cord to produce tire breaker fabric.

24. A method of manufacture for tire breaker fabric comprising a single continuously laid, zig-zag reinforcing cord, the method comprising:
feeding a single breaker reinforcing cord to a tire cord laying head;
laying said tire cord across the width of the intended fabric;
effecting a 180° change of direction at one edge of the fabric being assembled to form a loop with a vertical axis at said edge;
bringing a first holding pin into engagement with said loop;
engaging a first pin pinching head around said pin to crimp said cord around said pin;
returning said cord across the width of the fabric;
forming a loop at the other edge of the fabric which is in turn engaged by a second holding pin and a second pinching head;
moving said first pin out of engagement with said first loop;
closing said first pinching head to crimp said first loop fully to a small radius;
opening said first pinching head to release said first loop;
propelling the first cord length across a laying table into a collecting unit and repeating the above steps to form an elongated cord assembly releasing the cords of said cord assembly individually and advancing each released cord to elastomer applying means to form a fabric sheet.

4,405,396

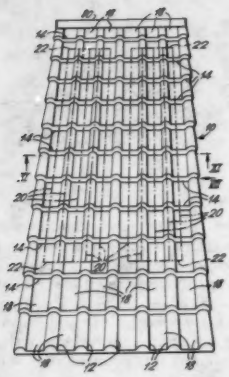
METHOD OF MAKING STATIC SOLAR HEAT COLLECTORS

Kenneth O. P. Brill-Edwards, Swansea, Wales, assignor to Crescent Roofing Company Ltd., Swansea, Wales

Division of Ser. No. 919,956, Jun. 28, 1978, Pat. No. 4,284,065. This application Mar. 3, 1981, Ser. No. 240,182

Int. Cl.³ B32B *31/26*; B29C *1/08*

U.S. Cl. 156—155 **10 Claims**



1. A method of manufacturing a solar heat collector for buildings comprising

laying up successive laminae of a structural plastics material in a mould to form a building panel;

allowing each lamina to gel before laying up the next of said laminae;

forming a non-laminate substance to the shape and size of a fluid circulation channel;

placing the thusly formed non-laminate in position on a selected one of said laminae when the selected lamina has gelled;

inserting flow and return pipe connections in the non-laminate;

sealing the non-laminate to the panel;

shaping a web of rigid material to a segment of a circle having a chordal length not greater than the length of said building panel;

pressing one edge of said web against the underside of the partly-formed panel and anchoring said web normal to said panel by means of a strap passed under tension along the free edge of said web and anchored at each end to the fabric of the panel;

laying up further lamina so as to encapsulate said non-laminate and said web to lock the said flow and return pipe connections in place, and

clearing a flow path through and between the said connections.

4,405,397

PROCESS FOR MANUFACTURING ELASTIC LEG DISPOSABLE DIAPERS

Richard K. Teed, Greenwood, S.C., assignor to Riegel Textile Corporation, Greenville, S.C.

Division of Ser. No. 85,372, Oct. 16, 1979. This application Nov. 3, 1980, Ser. No. 202,943

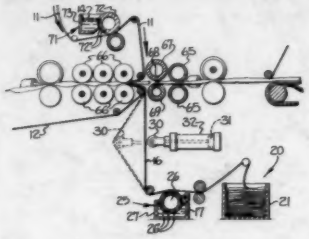
Int. Cl.³ B32B *31/00*

U.S. Cl. 156—164 **4 Claims**

1. A process of securing elastic strips within longitudinal edges of elastic leg disposable diapers having central crotch-fitting areas and outer waist-fitting areas to form gathered and extendible side portions in the crotch area of the diapers during manufacture of such diapers; said process comprising the steps of:

feeding continuous elastic strips from a supply into desired position in contact within the longitudinal edges of the diapers, while effecting adhesive securement therebetween along the entire length of the edges; and

alternately stretching and substantially relaxing predetermined lengths of the continuous elastic strips during said feeding step, while adhering the stretched lengths of the continuous elastic strips to the crotch areas and the relaxed lengths of the continuous elastic strips to the waist areas along the entire longitudinal edges of the serially-interconnected diapers; so that, the stretched lengths of the elastic strips will contract and form gathered and extendible side portions in the crotch area of the diaper.



4,405,398

PROCESS FOR FASTENING A BASE PLATE TO A POLE PREPARED BY CENTRIFUGAL CASTING

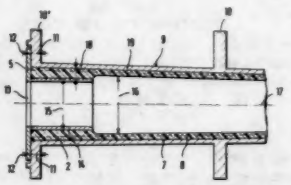
Bruno Rother, Neumarkt, and Hartmut Trommen, Postbauer-Heng, both of Fed. Rep. of Germany, assignors to G. A. Pfleiderer GmbH & Co., KG, Neumarkt, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 229,616

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032575

Int. Cl.³ B29C *5/04*

U.S. Cl. 156—242 **5 Claims**



1. A process for mounting a baseplate to a pole comprised of a synthetic resin during the fabrication of said pole, the process comprising the steps of:

(a) providing a mold having an inner wall the shape of which substantially conforms to the outer surface of said pole and having at least one longitudinal end thereof open;

(b) providing a baseplate and a baseplate extension connected to said baseplate and extending substantially perpendicularly thereto and substantially centrally therefrom, said baseplate being wider than the open end of said mold and said baseplate extension being less wide than the inner wall of said mold;

(c) inserting said baseplate extension into said mold through the open end thereof such that an annular gap exists between said baseplate extension and the inner wall of said mold;

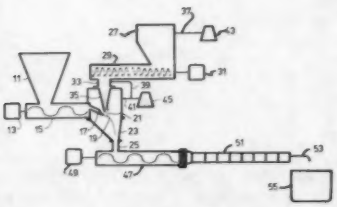
(d) placing said baseplate in a generally abuttiing relation with the open end of said mold;
(e) securing said baseplate to said mold such that when said mold is rotated about its longitudinal axis, said baseplate and said baseplate extension also rotate about the longitudinal axis with a rotational velocity equal to the rotational velocity of said mold;
(f) rotating said mold about its longitudinal axis; and
(g) injecting the synthetic resin into said mold in an amount sufficient to substantially fill the annular gap between said baseplate extension and the inner wall of said mold and thereafter solidifying said resin to thereby effect bonding between said baseplate extension and said solidified resin.

4,405,399

METHOD AND APPARATUS FOR MANUFACTURING DENTIFRICE CONTAINING DISPERSED SPECKLES

Edward J. Gibbons, Scotch Plains, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,271
Int. Cl.³ A61K 7/16
U.S. Cl. 156—243 **11 Claims**



1. A method for manufacturing a dentifrice containing dispersed discrete speckles therein which comprises producing a stream of a gel or paste dental composition continuously flowing in a direction having downward and horizontal components, which dental composition constitutes a major proportion of the dentifrice and contains a gelling agent which helps to make surfaces thereof adhesive for the speckles, producing a stream of speckles to be distributed throughout the dentifrice, directing said stream of speckles downwardly onto a surface of the stream of the dental composition and controlling the relative feed rates and the proportions of the streams of dental composition and the speckles to be dispersed in the dentifrice so that when the stream of speckles contacts the stream of dental composition the speckles are insufficient to cover the dental composition surface, so that the speckles adhere to the dental composition stream and there is produced a dentifrice containing the speckles in desired proportion distributed in it.

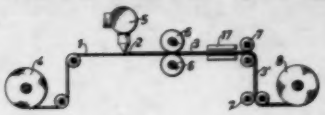
4,405,400

LAMINATED MATERIAL

Peter Petersen-Hoj, Espergärde, Denmark, assignor to Tetra Pak Developpement SA, Switzerland

Division of Ser. No. 173,649, Jul. 30, 1980, Pat. No. 4,373,002. This application Aug. 20, 1982, Ser. No. 409,974
Claims priority, application Switzerland, Jul. 30, 1979, 7027/79
Int. Cl.³ B29C 19/00; B28B 3/20; B32B 7/02
U.S. Cl. 156—244.11 **3 Claims**

1. A method for the manufacture of a laminated material, comprising the steps of joining together at least two layers of polyester material, a first layer being modified polyester material and being of the type which can be subjected to a stretching treatment at a temperature below 100° C. without amorphous molecular structure being wholly lost, a second layer being polyester material whose molecular structure becomes crystalline when the material is subjected to a stretching at a temperature below 100° C., and subjecting the layers so combined to a joint stretching operation at a temperature below 100° C.

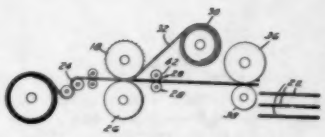


4,405,401

THERMOPLASTIC LABELING AND METHOD OF MAKING SAME

Ted A. Stahl, 37101 Brynford, Mt. Clemens, Mich. 48043

Filed Jul. 15, 1981, Ser. No. 283,564
Int. Cl.³ B32B 31/00; B65C 9/25; C09J 5/00
U.S. Cl. 156—248 **2 Claims**



1. The method of producing labels in the form of symbols, such as numbers, letters and the like, for bonding to clothing or the like, by the application of heat comprising the steps of:
providing a strip comprising a release carrier at least one side of which has a release surface thereon and a thermoplastic film carried by the carrier and lightly bonded by heat to the release surface and peelable therefrom;
kiss cutting the strip to form labels in the film on the carrier by cutting through the film but not through the carrier, whereby labels and waste film material are on the carrier said waste portion being lightly adhered to the release surface and peelable therefrom; and
severing the strip at longitudinally spaced intervals forming successive individual label bearing sections each having a length of the carrier with a plurality of the film labels lightly bonded to the release surface and individually peelable therefrom such that each of said labels may be bonded by heat to clothing or the like.

4,405,402

PIEZOELECTRIC/PYROELECTRIC ELEMENTS

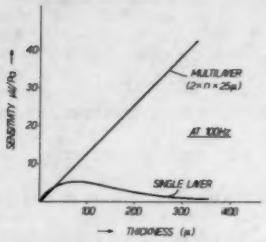
Robert M. Quilliam, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Oct. 10, 1980, Ser. No. 195,772
Claims priority, application United Kingdom, Oct. 12, 1979, 7935443
Int. Cl.³ B32B 31/20; H01G 7/02; H01L 41/22
U.S. Cl. 156—273.7 **8 Claims**

1. A method for the construction of a piezoelectric/pyroelectric element comprising an electrically-polarised laminar stack of individually thin polarisable plastics films, wherein each polarisable plastics film is essentially in face-to-face contact with its two neighbours, there being no significant gas space/pockets between any two adjacent films, in which method:
(a) the required number of films of the unpolarised but polarisable plastics substance is assembled together in the form of a multilayer sandwich adjacent individual films of which are essentially in face-to-face contact;
(b) the assembly is heated to a temperature somewhat below the deflection temperature of the plastics substance;

(c) while still hot, a polarising electric field is applied across the assembly, from end face to end face;

(d) while still applying the polarising field, the assembly is allowed to cool down; and



(e) after assembly but before cooling adjacent individual films of the assembly are bonded together.

4,405,403

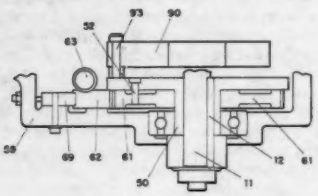
ARTICLE HOLDING TURRET

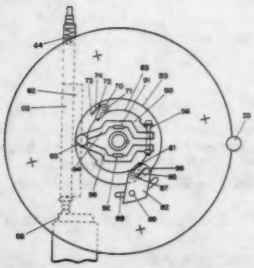
Robert M. Jodrey, Westboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 20, 1981, Ser. No. 255,968

Int. Cl.³ B44C *1/00*; B65C *9/04, 9/00*

U.S. Cl. 156—449 **12 Claims**





1. An improved article-holding turret of the type including a rotor assembly for engaging and rotatably conveying articles, past a labeling site whereby labels are applied to the articles an oscillating drive assembly for indexing the rotor assembly through a predetermined angle in a forward direction, and a brake for preventing the rotation of the rotor assembly in the reverse direction, wherein in the improved turret the brake rotates with the drive assembly, said turret further comprising means for preventing the reverse rotation of the rotor assembly during the reverse rotation of the drive assembly and brake.

4,405,404

APPARATUS FOR OXYGENATING AN EXTRUDED MOLTEN POLYETHYLENE FILM

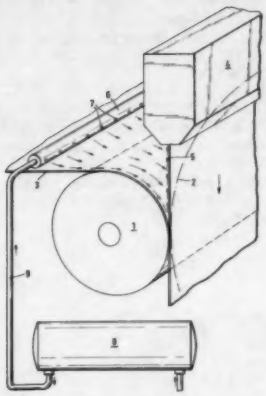
Fritz Blom, Westphalia, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,212

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045413

Int. Cl.³ B29D *7/02*; B32B *31/14, 31/22*

U.S. Cl. 156—497 **2 Claims**



1. An apparatus for oxygenating an extruded molten polyethylene film before compressing it with a carrier web for joining thereto comprising a pressure roller and a cooling roller forming a backing roller, a wide-slot extrusion nozzle disposed above the nip of the rollers, and an ozone nozzle, characterised in that the ozone nozzle comprises a tube (6) which has blow nozzles (7) arranged in a row, is disposed above the carrier web (3) parallel to the axis of the pressure roller (1), and touches or almost touches the carrier web (3) in the region where it runs onto the pressure roller, the direction of blowing by the nozzles being substantially tangential to the pressure roller (1).

4,405,405

BLAZED DIFFRACTION GRATING STRUCTURES AND METHOD OF MANUFACTURING THE SAME

Yohji Fujii, and Junichiro M[illegible]aowa, both of Yokosuka, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Division of Ser. No. 58,382, Jul. 17, 1979, Pat. No. 4,330,175. This application Nov. 30, 1981, Ser. No. 325,721

Claims priority, application Japan, Jul. 18, 1978, 53-87344; Apr. 4, 1979, 54-40517; Apr. 6, 1979, 54-41669

Int. Cl.³ G02B *5/18*

U.S. Cl. 156—633 **9 Claims**

1. A method of manufacturing a curved diffraction grating structure in which a major surface of a single crystalline silicon substrate is provided with a plurality of triangular grooves at a pitch of P, each groove having an asymmetric cross-sectional shape and a wall inclined by an angle of θ with respect to said major surface so as to satisfy an equation

$$\theta = \sin^{-1}\frac{m\lambda_B}{2P},$$

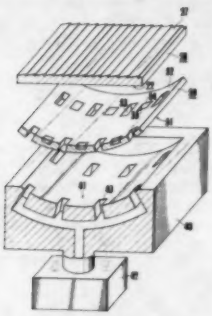
where θ represents a blaze angle, P the pitch of the groove, λ_B the blaze wavelength, and m the order of diffraction, and wherein when said plurality of triangular grooves are projected on a plane, a pattern is formed in which the projections

of the grooves are arrayed in parallel at said pitch, said method comprising the steps of:

utilizing a {hkl} plane (where h=k) inclined by said angle θ with respect to the {111} plane of said single crystalline silicon as parallel opposing first and second major surfaces;

applying an etching mask onto said first major surface;

anisotropic-etching said single crystalline silicon through said etching mask with an etching solution having different etching speeds for the different crystallographic directions of said single crystalline silicon, thus forming a planar diffraction grating, said planar diffraction grating forming a second plurality of triangular grooves when said planar diffraction grating is curved with said first major surface inward;



mounting said planar diffraction grating on a supporting member with a portion of said second major surface in contact with a portion of a curved surface of said supporting member, said curved surface being provided with recesses containing an adhesive and evacuation openings;

applying a negative pressure to the second major surface through said evacuation openings thereby bending said planar diffraction grating to conform with said curved surface.

2. A method according to claim 1 further comprising the step of applying a metal coating having a uniform thickness onto the walls of said triangular grooves upon which light impinges.

3. A method according to claim 1 which further comprises the step of isotropic-etching which is performed in immediate succession to said anisotropic etching.

4,405,406

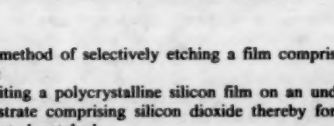
PLASMA ETCHING PROCESS AND APPARATUS

Martin J. Casey, Mesa, Ariz., and John E. Sheppard, Bensalem, Pa., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 171,790, Jul. 24, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 386,826

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **1 Claim**



1. A method of selectively etching a film comprising the steps of:

depositing a polycrystalline silicon film on an underlying substrate comprising silicon dioxide thereby forming a film-to-be-etched;

inserting said polycrystalline silicon film on said underlying substrate into a vacuum chamber;

supplying dichlorofluoro-methane gas to said vacuum chamber;

applying a radio frequency voltage across said dichlorofluoro-methane gas supplied to said chamber, thereby causing said gas to disassociate and form radicals which chemically interact to etch select areas of said film, said film being etched substantially without lateral etching and said select areas of said film being etched at a rate essentially 15 times greater than the etching rate of silicon dioxide comprising said substrate.

4,405,407

FIBROUS MATERIALS

Pudens L. Ragg, Hartburn; Graham E. Martin, Nunthorpe, and Roy Smeeton, Sedgefield, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 2, 1981, Ser. No. 250,154

Claims priority, application United Kingdom, Apr. 16, 1980, 8012488

Int. Cl.³ D21H *5/12*

U.S. Cl. 162—146 **7 Claims**

1. A process for making a shaped article comprising

(i) forming a solution of an amino-formaldehyde resin free of bound inorganic oxyacid radicals and a curing agent therefor into fibres, said solution being free of carbohydrates,

(ii) curing said fibres by heating them at above 100° C. until their degree of cure is at least 93%.

(iii) forming an aqueous pulp by dispersing fibrous material in water, said fibrous material containing at least 5% by weight of said cured amino-formaldehyde resin fibres,

(iv) forming a shaped article from said pulp, and

(v) promoting inter-fibre bonding by heating said shaped article at a sufficiently high temperature above 80° C., for sufficient time, and in the presence of a sufficient amount of water above 10% by weight of the total weight of fibrous material present, with the application of pressure, before or during said heating, at least sufficient to cause contact between adjacent fibres, so as to cause at least some of the amino-formaldehyde resin fibres to weld to one another and/or to other fibrous material present at at least some of the points where the fibres touch one another.

4,405,408

CELLULOSE PROCESSING AGENTS AND PAPER PROCESSED THEREWITH

Shigehiko Yoshioka; Hideto Yamada, and Akira Asakura, all of Akashi, Japan, assignors to Seiko Kagaku Kogyo Co., Ltd., Hyogo, Japan

PCT No. PCT/JP80/00142, § 371 Date Jan. 20, 1982, § 102(e) Date Jan. 20, 1982, PCT Pub. No. WO82/00038, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 24, 1980, Ser. No. 346,056

Int. Cl.³ D06M *13/10;* **D21H** *3/02*

U.S. Cl. 162—158 **6 Claims**

1. A cellulose treating agent obtained by dispersing an alkyl ketene dimer in water in the presence of a dispersing agent, said dispersing agent comprising: (a) reaction product of a polyalkylenepolyamine and a mixture of carboxylic acids containing at least 20% by weight of aliphatic monohydroxymonocarboxylic acids having 9 to 32 carbon atoms: or (b) a product obtained by reacting epihalohydrin with said reaction product.

4. Paper sized with a cellulose treating agent which is obtained by dispersing an alkyl ketene dimer in the presence of a dispersing agent, said dispersing agent comprising: (a) a reaction product of a polyalkylenepolyamine and a mixture of carboxylic acids containing at least 20% by weight of aliphatic monohydroxymonocarboxylic acids having 9 to 32 carbon

atoms and 0 to 50% by weight of aliphatic dicarboxylic acids having 4 to 40 carbon atoms or; (b) a product obtained by reacting epihalohydrin with said reaction product.

4,405,409

METHOD AND APPARATUS FOR DEHYDRATING MIXTURES OF ORGANIC LIQUIDS AND WATER

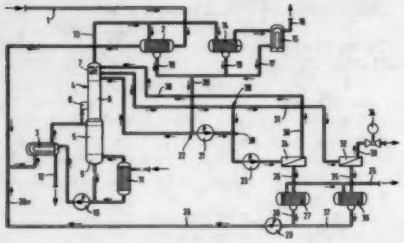
Gunter Tusel, Lieselottenstr. 12, D-6650 Homburg/Saar, and Achim Ballweg, Am Hain 4, D-6650 Homburg-Sanddorf, both of Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,560

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037736

Int. Cl.³ B01D *3/14, 13/00*

U.S. Cl. 202—200 **9 Claims**



1. In a method of dehydrating a mixture of an organic liquid and water, which comprises subjecting the mixture to initial distillation to remove an initial quantity of water followed by membrane permeation to remove substantially the remaining water, the improvement which comprises withdrawing at least a portion of the material retained by the membrane separator, passing that material into indirect heat exchange relationship within the distillation column and recycling at least a portion of that withdrawn material back to the separator, the quantity of such recycle stream being such that substantially the whole of the heat required for the membrane permeation is transmitted to the recycle stream during said heat exchange within the distillation column.

8. Apparatus for dehydrating mixtures of an organic liquid and water comprising a distillation column and a membrane separator connected in series for the initial distillation and subsequent membrane separation of the mixture to remove water remaining in the distillate from the distillation column and including a recycle circuit for withdrawing at least a portion of the material retained by the separator, a heat exchanger within the distillation column connected in said recycle circuit for indirect heat exchange between said portion of withdrawn material, and a recycle conduit for return of at least a portion of the heated withdrawn material from the heat exchanger to the membrane separator.

4,405,410

MASKING OF ELONGATE THREE DIMENSIONAL OBJECTS FOR THE EXPOSURE OF PRESELECTED AREAS FOR SURFACE TREATMENT

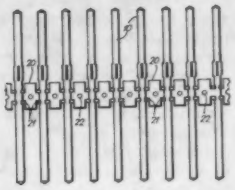
Leslie Sebastien, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 15, 1982, Ser. No. 339,394

Int. Cl.³ C25D *5/02, 17/04*

U.S. Cl. 204—15 **6 Claims**

1. A masking member for masking at least an end portion of elongate pins, said masking member being of a flat, platelike form having top and bottom edges and including a plurality of parallel bores extending from said top edge towards said bottom edge, each bore of a size to be a close sliding fit on a pin; the masking member having a vertical cross-section with a thickened portion at top and bottom connected by a thinner central, waisted, portion, the waisted portion at least on one side extending inward to coincide with said bores, a plurality



of apertures being formed in said waisted portion, an aperture connecting with each bore.

4,405,411

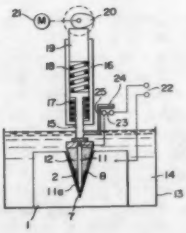
RECESS ELECTRODEPOSITING METHOD, ELECTRODE ASSEMBLY AND APPARATUS

Kiyoshi Inoue, Tokyo; Makoto Onoue, and Noriyoshi Otaki, both of Yokohama, all of Japan, assignors to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 12, 1982, Ser. No. 338,901

Int. Cl.³ C25D *5/04, 17/10*

U.S. Cl. 204—26 **12 Claims**



1. A method of forming an electrodeposited metallic layer on a wall of a recess in a workpiece and at least on a bottom area in the recess, said method comprising the steps of:

(a) preparing an electrodepositing electrode assembly comprising an electrodepositing electrode element and a support member so formed as to contain said electrode element therein and have a surface contour complementary to a surface contour of said recess in said workpiece, said support member comprising a porous mass composed at least in part of an electrically non-conductive material and having abrasive particles distributed therein at least along said contoured surface thereof;

(b) positioning said electrodepositing electrode assembly and said workpiece to establish generally a mating engagement of said support member with said recess;

(c) supplying an electrodepositing liquid electrolyte onto said wall of said recess;

(d) reciprocating at least one of said electrode assembly and said workpiece so as to repetitively bring said support member into contact with and away from the surface of said recess in the mating engagement therewith; and

(e) passing an electrodepositing electric current between said electrode element and said workpiece at least during a time period in which said support member and said surface of the recess are brought together in step (d) to electrodeposit a metal from said liquid electrolyte at least on said bottom area in said recess.

4,405,412

REMOVAL OF COPPER CONTAMINATION FROM TIN PLATING BATHS

Christy A. Nardelli, Delaware, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 29, 1982, Ser. No. 362,589
Int. Cl.³ C25D 3/32
U.S. Cl. 204—54 R 6 Claims

1. A method for the treatment of copper-contaminated aqueous acid plating baths for the electrodeposition of bright tin comprising adding to said bath which further comprises from about 5% to about 40% of a free acid; and from about 0.1 to about 10 ounces per gallon of stannous ion an additional comprising from about 0.01% to about 1% of sodium formaldehyde sulfoxylate thereby overcoming plating haze and low current density dullness due to copper contamination in the tin bath.

4,405,413

BLUSH-FREE ACID ZINC ELECTROPLATING BATHS AND PROCESS

Carol W. Skimin, Mayfield Hts., Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

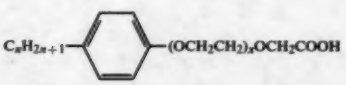
Filed May 20, 1982, Ser. No. 379,833
Int. Cl.³ C25D 3/22
U.S. Cl. 204—55 R 4 Claims

1. An aqueous acid zinc electroplating bath comprising

A. a source of zinc ions,

B. at least one organic brightening agent, and

C. a surfactant to keep the brightening agent dispersed throughout the bath and consisting of a mixture of at least two carboxy-terminated ethylene oxide adducts of a long chain alkyl phenol having the general formula



wherein one of the long chain alkyl phenols is present in an amount of between 30–70%, n is either 8 or 9, and in which x is between about 17 and about 21 and the second is present in an amount of between 70–30%, n is either 8 or 9, and x is between about 9 and about 12.

4,405,414

PROCESS FOR MANUFACTURING A SELECTIVE ABSORBER OF A SOLAR COLLECTOR AND SELECTIVE ABSORBER SO OBTAINED

Lucien Aries, Montgiscard, and Jean-Pierre Traverse, Ramonville Saint Agne, both of France, assignors to Agence Nationale de Valorisation de La Recherche (A.N.V.A.R.), Paris Cedex, France

Continuation-in-part of Ser. No. 167,042, Jul. 9, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,135
Claims priority, application France, Jul. 11, 1979, 79 18414
Int. Cl.³ C25D 11/34
U.S. Cl. 204—56 R 15 Claims

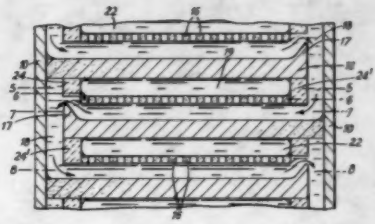
1. A process for producing a selective absorber for a solar collector panel having high absorption and low emissivity comprising providing a panel formed from an alloy of iron and at least one filler metal, comprising chromium alloyed with said iron, subjecting said panel as an anode to anodic oxidation in an acidic electrolytic bath containing at lest one electroactive substance containing atoms selected from the group consisting of sulfur, selenium and tellurium, the electrolytic potential between the anode and the cathode being set to such a value that the anode potential will be between the natural corrosion potential and the primary passivation potential of the alloy forming said panel.

4,405,415

ELECTROLYTIC REFINING OF MOLTEN METAL

Ernest W. Dewing, and Adam J. Gesing, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 5, 1981, Ser. No. 308,472
Claims priority, application United Kingdom, Oct. 7, 1980, 8032268
Int. Cl.³ C25C 3/06, 3/08, 3/04
U.S. Cl. 204—67 22 Claims



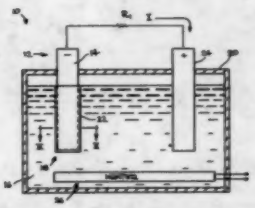
1. A process for the electrolytic refining of impure molten metal, selected from the group consisting of aluminium and magnesium by passing current between a cathode composed of relatively pure molten metal and an anode composed of the impure molten metal through an intermediate layer of molten electrolyte for transport of ions of the selected metal characterised in that the molten electrolyte is contained within the interstices of a non-conductive grille member, said interstices having a minimum transverse dimension in the range of 0.1–1 cm.

4,405,416

MOLTEN SALT LITHIUM CELLS

Ian D. Raistrick, Menlo Park; Jaime Poris, Portola Valley, and Robert A. Huggins, Stanford, all of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Division of Ser. No. 170,254, Jul. 18, 1980, Pat. No. 4,315,059. This application Sep. 15, 1981, Ser. No. 302,337
Int. Cl.³ C25C 3/02; H01M 6/36, 8/14
U.S. Cl. 204—68 3 Claims



1. A method of processing lithium comprising the steps of:

providing a quantity of an electrolyte, said electrolyte including lithium moieties and a mixture of nitrate moieties, and said electrolyte having a melting point in the range of about 100° to about 170° C.;

contacting said electrolyte with a quantity of elemental lithium; and,

selectively conducting lithium ions between said quantity of electrolyte and said quantity of elemental lithium

heating said quantity of electrolyte to a temperature in the range of about 100° to about 170° C. to form a molten state thereof, and maintaining said temperature and said molten state during the selectively conducting step.

4,405,417

PROCESS FOR THE MANUFACTURE OF CYCLOHEXENE DERIVATIVES

Hansjörg Grass, Muttenz, and Reinhard Zell, Rodersdorf, both of Switzerland, assignors to Hoffmann- La Roche Inc., Nutley, N.J.

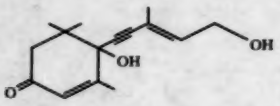
Filed Jan. 17, 1983, Ser. No. 458,428

Claims priority, application Switzerland, Feb. 9, 1982, 784/82

Int. Cl.³ C25B *3/00*

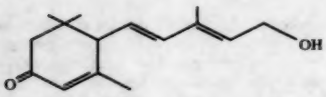
U.S. Cl. 204—73 R **9 Claims**

1. A process which comprises cathodically reducing the compound of the formula



I

in a basic, aqueous-organic solvent mixture to give the compound of the formula.



II

4,405,418

PROCESS FOR THE PRODUCTION OF SODIUM CHLORATE

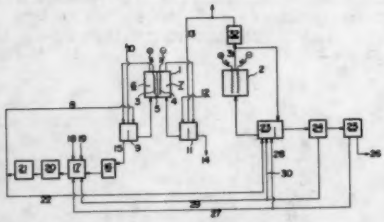
Reiji Takemura, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1981, Ser. No. 240,226

Claims priority, application Japan, Mar. 3, 1980, 55-2533; Nov. 6, 1980, 55-77858

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—95 **9 Claims**



1. In a process for the electrolysis of an aqueous sodium chloride solution which comprises, in combination, a diaphragmless process for the production of sodium chlorate using a sodium chlorate cell and a cation exchange membrane process for the production of sodium hydroxide and chlorine using a chlorine-alkali cell partitioned by means of a cation exchange membrane into a anode chamber and a cathode chamber, and wherein a weak saline solution taken out of the anode chamber of the chlorine-alkali cell is fed into the sodium chlorate cell, the improvement which comprises supplying sodium chloride to the weak saline solution taken out of the anode chamber of the chlorine-alkali cell to form an aqueous sodium chloride solution which is subsequently contacted with a porous iminodiacetic acid type chelating ion exchange resin comprising as a skeleton a chloromethylstyrene-divinylbenzene type crosslinked copolymer containing 9 to 17 mole % of divinylbenzene, said resin having an ion exchange capacity of 4.2–7.2 meq/g-dry resin, a water regain of 0.6 to 2.2 ml/g-dry resin and a total volume of micro pores having a diameter ranging from 500 to 3,000 A of 0.05 to 0.60 ml/g-dry resin, at a pH of 8.0 or more to remove impurities contained in said aqueous sodium chloride solution to an extent that the amounts of Ca, Mg and Ba ions in the resulting saline solution are 0.1 mg/liter or less, and at least part of the resulting saline solution is fed into the sodium chlorate cell, thereby enabling sodium chlorate to be produced at high concentration and at a stable electrolytic voltage.

4,405,419

METHOD FOR PRODUCING ELECTROLYTIC MANGANESE DIOXIDE

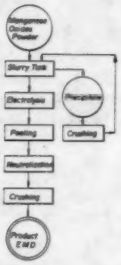
Masatoshi Misawa; Kusuhiko Takahashi, both of Tokyo; Kinosuke Okuda, Kisarazu; Kiyoshi Matsuura, Gunma; Hisao Takehara, and Keiichiro Ishikawa, both of Ichikawa, all of Japan, assignors to Japan Metal and Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1980, Ser. No. 215,849

Claims priority, application Japan, Dec. 13, 1979, 54-161839; Feb. 5, 1980, 55-12862; Dec. 13, 1979, 54-161840

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—96 **16 Claims**



1. A process for producing electrolytic manganese dioxide comprising electrolysis of an electrolyte comprising manganese sulfate containing a slurry of manganese oxides, wherein the manganese oxides are present in an amount from 0.01 to 0.4 grams per liter of electrolyte, said manganese oxide being no larger than 325 mesh in size.

4,405,420

CATALYZED ELECTROCHEMICAL GASIFICATION OF CARBONACEOUS MATERIALS AT ANODE AND ELECTROWINNING OF METALS AT CATHODE

Ronald J. Vaughan, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 28, 1981, Ser. No. 305,877

Int. Cl.³ C25C *1/06, 1/08, 1/10, 1/12*

U.S. Cl. 204—105 M **10 Claims**

1. In the electrochemical method of electrowinning a metallic element from an aqueous acidic electrolyte containing a metallic component as a cationic component comprising the steps of:

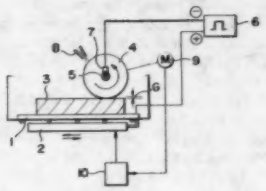
introducing carbonaceous materials and said electrolyte into an electrolysis cell having a cathode electrode and an anode electrode; and applying an electromotive force across said electrodes; wherein said carbonaceous materials react at said anode and said metallic component is deposited at said cathode, the improvement which comprises adding an amount of iron in its elemental, +2 or +3 valence state, or mixtures thereof to the electrolyte containing the carbonaceous material sufficient to increase the

rate of oxidation of the carbonaceous material at the anode.

4,405,421
METHOD OF AND APPARATUS FOR ELECTROCHEMICALLY GRINDING A CONDUCTIVE WORKPIECE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 18, 1981, Ser. No. 235,560
Claims priority, application Japan, Feb. 22, 1980, 55-21954; Oct. 8, 1980, 55-141518; Oct. 22, 1980, 55-148471
Int. Cl.³ B23P 1/10, 1/12, 1/14
U.S. Cl. 204—129.2 **29 Claims**



23. A method of electrochemically grinding an electrically conductive workpiece with a rotating wheel electrode constituted by an electrically conductive and abrasive electrode body wherein an electrochemical grinding current is passed between the workpiece and the rotating wheel electrode through a grinding interface flushed with a liquid electrolyte, the method comprising:

causing the workpiece to traverse the rotating wheel electrode along a predetermined rectilinear path repeatedly and over successive runs;

in each run, setting the depth of cut by the rotating wheel electrode in the workpiece as determined by the position of the workpiece traversing the rotating wheel electrode along said path to be not greater than 5 micrometers; and

repeating said each run to complete said successive runs whereby to cumulatively achieve a desired depth of cut in the workpiece.

24. The method defined in claim 23 wherein said electrochemical grinding current is passed in the form of a succession of electrical pulses.

25. The method defined in claim 24, further comprising:

applying a monitoring pulse during at least a portion of the off-time of said electrochemical grinding current pulses across said grinding interface; and

sensing an electrical magnitude of said grinding interface resulting from said monitoring pulse, thereby determining the wear of said wheel electrode.

4,405,422
METHOD OF ANODICALLY DEBURRING ARTICLES OF COPPER OR COPPER ALLOY

Karl-Imgemar Blomsterberg, Högstensgatan 60, 423 00 Torslanda, Sweden

PCT No. PCT/SE82/00010, § 371 Date Sep. 14, 1982, § 102(e) Date Sep. 14, 1982, PCT Pub. No. WO82/02408, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 15, 1982, Ser. No. 420,253
Int. Cl.³ C25F 3/02
U.S. Cl. 204—129.85 **10 Claims**

1. A method of anodically deburring articles of copper or copper alloy, characterized in that the treatment is carried out in an acid solution having a pH not exceeding 6.5 and containing

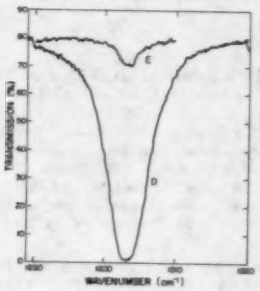
	grams per liter
water	100 to 300
alkali sulphamate	50 to 150
polyhydric alcohol	400 to 800
alkali nitrate	50 to 150

at a bath voltage of 5 to 30 volts and a current density of 2 to 50 amperes per square decimeter.

4,405,423
METHOD FOR REMOVAL OF PHOSGENE FROM BORON TRICHLORIDE

Samuel M. Freund, Santa Fe, N. Mex., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 3, 1981, Ser. No. 299,233
Int. Cl.³ B01J 19/12
U.S. Cl. 204—157.1 R **9 Claims**



1. A method for the photolytic removal of phosgene impurity from samples of boron trichloride, comprising the steps of:

(a) irradiating a boron trichloride sample with ultraviolet radiation of sufficient intensity to photolyze the phosgene impurity therein; and

(b) removing the photolysis products from the boron trichloride.

4,405,424
METHOD FOR PRODUCING HYDROGEN AND ELEMENTAL SULPHUR BY PHOTOCHEMICAL OXIDATION-REDUCTION OF HYDROGEN SULPHIDE AND METAL SULPHIDES

Michael Graetzel, 2, chemin Pontfilet, 1093 La Conversion, Switzerland; Kuppuswamy Kalyanasundaram, Chavannes; Enrico Borgarello, Echandens, both of Switzerland, and Ezio Pelizzetti, Turin, Italy, assignors to Michael Graetzel, La Conversion, Switzerland

Filed May 28, 1982, Ser. No. 383,272
Claims priority, application Switzerland, Jun. 3, 1981, 3636/81
Int. Cl.³ B01J 19/12
U.S. Cl. 204—157.1 R **13 Claims**

1. Method for producing hydrogen and elemental sulphur by photochemical oxidation-reduction of hydrogen sulphide and metal sulphides by an electromagnetic radiation comprising visible radiation, characterized in that an irradiation is effected of the hydrogen sulphide or the metal sulphide in solution in a solvent and in the presence of a catalyst consisting of a semiconductor material, the surface of the semiconductor material to be illuminated being covered by a transparent layer of RuO_2.

4,405,425

FLAME-RETARDANT POLYSILOXANE ELASTOMERS

August Schiller, Neuötting, Fed. Rep. of Germany, and Dietrich Wolfer, Untereching, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 220,473

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018549

Int. Cl.³ C08K 3/22, 3/04

U.S. Cl. 204—159.13 7 Claims

1. A composition capable of being cured to form a flame-retardant elastomer consisting essentially of an organopolysiloxane, graphite having a surface area of from 3 to 15 m^2/g, a compound selected from the group consisting of alumina trihydrate, ceric hydroxide, cerous hydroxide, tricalcium aluminate hexahydrate, magnesium hydroxide and mixtures thereof and a crosslinking agent.

4. The composition of claim 1, wherein the compound is alumina trihydrate.

4,405,426

SELF-CURING IRRADIATED BLEND OF EPOXY RESIN AND SALT OF QUATERNARY AMINO ESTER OF UNSATURATED ACID

Fumio Hosoi, Fujioka; Takashi Sasaki, Takasaki, and Miyuki Hagiwara, Maebashi, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,612

Claims priority, application Japan, Apr. 30, 1981, 56-65840

Int. Cl.³ C08F 2/54, 220/34; C08G 59/20; C08L 63/00

U.S. Cl. 204—159.15 13 Claims

1. A self-curing modified epoxy resin composition produced by irradiating with electron beams a mixture mainly composed of 60 to 98% by weight of an epoxy resin and 2 to 30% by weight of a quaternary salt containing an α,β-unsaturated carboxylic acid ester having one quaternized amine nitrogen atom in the ester group.

4,405,427

ELECTRODEPOSITION OF COATINGS ON METALS TO ENHANCE ADHESIVE BONDING

Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 25, 1981, Ser. No. 317,162

Int. Cl.³ C25D 13/06, 13/08

U.S. Cl. 204—181 R 33 Claims

1. A process for enhancing adhesive bonding of a metal substrate, which comprises passing an electric current through a non aqueous or aqueous electrolyte in which a metal substrate is the anode, the metal of said substrate being active and capable of forming an organometallic compound, said electrolyte containing a phosphorylated amide having a labile hydrogen, and capable of generating an anion during electrolysis, said phosphorylated amide being in the form of (a) an organic polymer consisting of a poly (phosphinohydrazide), a poly (phosphinoguanide) or a poly (phosphinoureide), including homopolymers and copolymers thereof, and their thio analogs, or (b) a 2:1 molar adduct of two moles of a nitrogen-containing compound of the group consisting of hydrazine, guanidine and urea, and its thio analog, to one mole of and organic phosphite or phosphonate, and their thio analogs, and electrodepositing a coating of said amide on said metal substrate wherein said anion is reacted with and is chemically bonded to the metal of said substrate.

4,405,428

BASE SOLUBILIZATION OF AN AZOLE-FUNCTIONAL RESIN AND ELECTRODEPOSITION OF SUCH SOLUBILIZED RESIN

Nicholas T. Castellucci, Pittsburgh; John F. Grunewalder, Glenshaw, both of Pa., and John S. Ostrowski, Richardson, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 229,495, Jan. 29, 1981, Pat. No. 4,360,614. This application Jul. 26, 1982, Ser. No. 401,488

Int. Cl.³ C25D 13/10

U.S. Cl. 204—181 R 9 Claims

1. A method of electrocoating an article comprising:

A. contacting said article which serves as an anode with an aqueous mixture of a reaction product, said reaction product comprising a product of the reaction of

(i) a N-heterocyclic compound selected from the group consisting of a triazole, a tetrazole and a mixture thereof, said N-heterocyclic compound substituted on at least one carbon atom in the N-heterocyclic ring by a group of the formula $-(X)_nSH$ wherein X represents an alkylene group containing from 1 to 6 carbon atoms optionally halogen substituted, a cycloalkylene group containing from 5 to 8 carbon atoms optionally halogen substituted, or a phenylene group optionally substituted by halogen and/or an alkyl group containing from 1 to 6 carbon atoms, and n represents 0 or 1, and

(ii) a polyepoxide containing 1,2-epoxy groups, wherein the ratio of equivalents of said N-heterocyclic compounds to epoxide equivalents of said polyepoxide is from about 0.5:1.0 to about 1.5:1.0, said reaction product solubilized by admixture with a base in an amount at least sufficient to water solubilize said reaction product; and

B. passing a direct current of electricity through said aqueous mixture between said article and a cathode thereby electrodepositing a film on said article.

4,405,429

OXYGEN DETECTOR

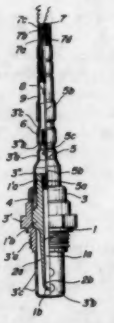
Hisaharu Nishio, Tokai, Japan, assignor to N G K Spark Plug Co., Ltd., Nagoya, Japan

Filed Feb. 11, 1981, Ser. No. 233,477

Claims priority, application Japan, Feb. 15, 1980, 55-18936[U]

Int. Cl.³ G01N 27/46

U.S. Cl. 204—421 13 Claims



1. An oxygen detector comprising a tubular oxygen detection element closed at one end and including outer and inner electrode layers extending upwardly from the closed end, the inner electrode layer terminating in a threaded upper end, casing means for sealing the oxygen detection element, said casing means having a metal casing electrically connected with the outer electrode layer of the oxygen detection element, a center conductor disposed within said casing means and including a flexible coil-shaped terminal threadedly engaged

with the threaded upper end of said inner electrode layer, an output delivering electric wire assembly fixed to an end of said casing means and having a coil spring lead wire (*7a*) and an annular resilient insulating material (*7b*) therearound so as to define a communicating hole (*7d*) for communicating the inner electrode layer of the oxygen detection element with the outside air, said coil spring lead wire connected electrically to said center conductor, wherein said center conductor has a resilient portion operative to apply a tensile force to the coil-shaped terminal of said center conductor to ensure contact between said coil-shaped terminal and said threaded end of said inner electrode layer, and said resilient portion is firmly fixed to said metal casing with an insulating material (**6**).

4,405,430

REMOTELY OPERABLE SAMPLE-TAKING APPLIANCE, ESPECIALLY FOR ASCERTAINING RADIO ACTIVITY PROFILES IN CONTAMINATED MATERIAL SURFACES

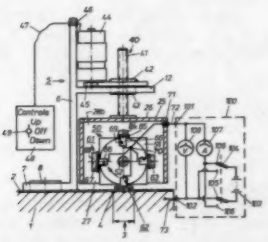
Jozef Hanulik, Zurich, Switzerland, assignor to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule, Zurich, Switzerland

Filed Mar. 13, 1981, Ser. No. 243,557

Claims priority, application Switzerland, Mar. 20, 1980, 2184/80

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—400 **10 Claims**



1. A remotely-operable sample-taking appliance, especially for ascertaining radioactivity profiles in contaminated material surfaces and the chemical composition of strata close to the surface, in which a layer of material is removed electrolytically from the surface region to be examined for each sample by means of a sensor containing a sponge impregnated with an electrolyte, and in that the removed material is absorbed in the sensor sponge for a subsequent chemical analysis and/or analysis of its radioactivity, in order to produce an activity profile of the surface region from a plurality of successive samples, the improvement comprising at least three sensors, a common current connector connected to said sensors, sponges of graduated sizes of application areas associated respectively with said sensors, a sensor carrier carrying said sensors, an appliance framework in which said carrier is arranged for upward and downward movement, and remotely operable setting devices and lifting devices arranged on the framework and effective to bring the individual sensors successively and sequentially in the order of a decreasing sponge application area into a working position and thereafter to lower the sensor in said working position with the sensor carrier to an operative position with defined application pressure of its sponge on the surface region to be examined.

4,405,431

APPARATUS FOR PARTIAL ELECTROLYTIC COATING OF INDIVIDUAL METAL PARTS

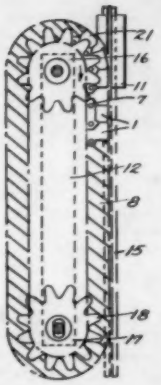
Alfred Pfeifer, Altenstadt; Rudolf Seif, Bruchkobel, and Dietmar Holdt, Leinzell, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,335

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028635

Int. Cl.³ C25D *17/06*; B05C *3/10*; C25D *17/28*

U.S. Cl. 204—202 **18 Claims**



1. An apparatus for the partial electrolytic coating of individual metal parts, especially pins, switches and belts for electrical contacts, consisting essentially of an electrolyte tank, a conveying chain means running over a pair of rolls for fastening and contacting the parts to be coated, means for loading and withdrawing the parts to be coated, said conveying chain means comprising individual holding elements which are joined directly together by pins, said holding elements comprising a contact cover plate and a clamping cover plate, means for spacing the clamping cover plate from the contact cover plate and spring means adopted to force the clamping cover plate toward the contact cover plate, said rolls being provided with a groove having a conically shaped side surrounding each roll.

4,405,432

PLATING HEAD

Lex A. Kosowsky, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 22, 1982, Ser. No. 436,090

Int. Cl.³ C25D *17/00, 21/10*

U.S. Cl. 204—206 **3 Claims**

1. A system for plating selected areas of a web of material comprising:

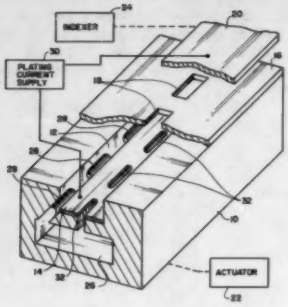
a plating head of electrically insulating material and having a recessed channel therein;

masking means operable to sealingly engage said web, said masking means having apertures so as to expose said selected areas to an electrolyte solution, said masking means disposed adjacent said plating head and over said recessed channel with said apertures in communication with said recessed channel;

an electrode in the bottom of said channel, said electrode having an extended generally planar continuous conducting surface positioned generally parallel to the masking means so as to expose the surface maximally to said apertures;

first passageways in said plating head adapted to convey the major portion of the electrolyte into the space between

said apertures and said electrode surface, said first passageways opening in the side of said recessed channel so as to supply fresh electrolyte along the length of the channel;



second passageways to convey electrolyte through small openings in said surface of the electrode so as to enhance turbulent flow of electrolyte in said channel; and

plating current supply means connected to said electrode means and to said web.

4,405,433

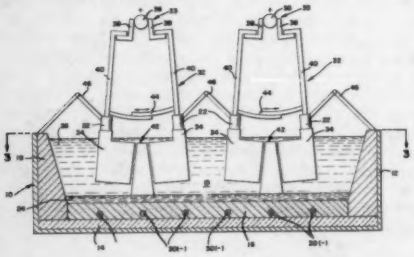
ALUMINUM REDUCTION CELL ELECTRODE

John R. Payne, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Apr. 6, 1981, Ser. No. 251,652

Int. Cl.³ C25C *3/08, 3/16*

U.S. Cl. 204—225 **12 Claims**



1. In an electrolytic cell for the reduction of alumina having a cavity lined with refractory material and adapted to contain a molten aluminum body and a less dense body of molten electrolyte containing dissolved alumina, an anode-cathode structure comprised of at least one prebake anode depending into said cavity and a refractory hard metal cathode assembly positioned in said cavity and adapted to be in electrical relationship with said anode through the medium of said electrolyte, said anode-cathode structure having at least one planar anode surface with a high degree of slope measured from a horizontal plane through the cell and in juxtaposition with a substantially parallel planar surface of said cathode assembly, the improvement comprising at least one anode-cathode structure disposed within the cell, said structure having a wedge shaped replaceable cathode assembly having two cathode surfaces of refractory hard metal, each cathode surface having a high degree of slope and extending into the cell from a first apex and two prebake carbon anodes depending into the cell from a second apex, above said first apex, and in an angular, straddling relationship with said cathode surfaces, each anode having a surface adapted to be paired in essentially parallel planar relationship with a sloped cathode surface, means for spatially adjusting the distance between the paired anode and cathode surfaces, each of said cathode surfaces supported in operating position by clamping means located at least at one extremity thereof, said clamping means exerting a minimum of applied force on the cathode surface.

4,405,434

RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 179,150, Aug. 18, 1980, Pat. No. 4,370,361, which is a division of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Nov. 9, 1981, Ser. No. 338,383

Int. Cl.³ C25B *11/04*

U.S. Cl. 204—293 **3 Claims**

1. An improved low overvoltage electrode for use in a hydrogen evolution cathode in an electroytic cell, the electrode being of the type that has a Raney metal surface layer in electrical contact with a conductive metal core, wherein the improvement comprises: said electrode being a monolithic structure having a conductive core comprised of a nickel-molybdenum alloy, and wherein said Raney metal surface is an adherent Beta phase crystalline intermetallic layer derived from and integral with said core, said nickel being stabilized by a stabilizing amount of molybdenum in said crystalline structure.

4,405,435

APPARATUS FOR PERFORMING CONTINUOUS TREATMENT IN VACUUM

Hideki Tateishi, Yokohama; Tsuneaki Kamei, Kanagawa; Katsuo Abe, Yokosuka; Shigeru Kobayashi, Kawasaki; Susumu Aiuchi, Yokohama; Masashi Nakatsukasa, Tama; Nobuyuki Takahashi, Mitaka, and Ryuji Sugimoto, Sagamihara, all of Japan, assignors to Hitachi, Ltd. and Anelva Corporation, both of Tokyo, Japan

Filed Aug. 26, 1981, Ser. No. 296,314

Claims priority, application Japan, Aug. 27, 1980, 55-117069; Aug. 27, 1980, 55-117070; Oct. 3, 1980, 55-137802; Oct. 3, 1980, 55-137804

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **12 Claims**

1. An apparatus for performing continuous treatment in vacuum, comprising:

(a) an inlet chamber having atmospheric leak means connected thereto and including therein a cassette elevator for moving upwardly and downwardly a cassette in which a number of shelves are arranged in a vertically spaced relation to receive a number of articles with predetermined spacing intervals defined thereamong, said inlet chamber being adapted to subject, collectively, the number of articles received in said cassette to evacuation treatment;

(b) a first intermediate chamber including therein a cassette elevator for moving upwardly and downwardly a cassette in which a number of shelves are arranged in a vertically shaped relation to receive the articles with predetermined spacing intervals defined thereamong, said first intermediate chamber being adapted to receive therein the number of articles in a manner that the articles are received in the cassette located therein;

(c) a vacuum treating chamber having at least one vacuum treating means mounted therein;

(d) a second intermediate chamber including therein a cassette elevator for moving upwardly and downwardly a cassette in which a number of shelves are arranged in a vertically spaced relation to receive the articles with predetermined spacing intervals defined thereamong, said second intermediate chamber being adapted to receive therein the number of articles in a manner that the articles are received in the cassette located therein;

(e) a withdrawing chamber including therein a cassette elevator for moving upwardly and downwardly a cassette

in which a number of shelves are arranged in a vertically spaced relation to receive said articles with predetermined spacing intervals defined thereamong, said withdrawing chamber being connected to atmospheric leak means;

(f) opening means provided between the adjacent chambers, said opening means being normally closed and opened only when said articles are passed therethrough one by one;

(g) conveyor means mounted in each of said chambers for horizontally conveying each of said articles as a single body through said opening means; and

(h) evacuating means connected to each of said chambers;

(i) said inlet chamber, first intermediate chamber, vacuum treating chamber, second intermediate chamber and withdrawing chamber being arranged successively in a direction in which the articles are successively transferred;

(j) the apparatus being constructed such that, while the number of articles in said inlet chamber and said withdrawing chamber are being subject, collectively, to the evacuation treatment, the articles received in the cassette in said first intermediate chamber are taken out successively one by one and horizontally conveyed by said conveyor means and the respective articles thus successively conveyed are successively subject to the vacuum treatment by said vacuum treating means and then conveyed by said conveyor means successively into the cassette in said second intermediate chamber.

4,405,436

SPUTTERING APPARATUS

Harukiro Kobayashi, Zushi; Hidefumi Funaki, Hamura, and Takehiro Sakurai, Hino, all of Japan, assignors to Anelva Corporation, Fuchu, Japan

Filed Nov. 4, 1982, Ser. No. 439,044

Claims priority, application Japan, Jun. 16, 1982, 57-102260

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **12 Claims**

1. In sputtering apparatus of the type wherein a cathode including a target made of ferromagnetic material and a substrate to be sputtered are disposed in an evacuated vessel in a spaced opposing relationship so as to sputter said target with ions to form a thin magnetic film on said substrate, the improvement which comprises a magnet, a shield covering a surface of said magnet facing said substrate, said shield being made of the same or similar material as said target, a metal block disposed to surround said magnet and covered by said shield and a backing plate made of ferromagnetic material which supports the magnet, the block and the shield, and a passage for passing cooling water to cool the above components.

4,405,437

PROCESS FOR COAL LIQUEFACTION EMPLOYING A SUPERIOR COAL LIQUEFACTION PROCESS SOLVENT

Conrad J. Kulik, Newark, and Linda Atherton, Los Altos, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jan. 11, 1982, Ser. No. 338,259

Int. Cl.³ C10G *1/06, 1/00*

U.S. Cl. 208—10 **16 Claims**

1. A process for coal liquefaction employing a superior coal liquefaction solvent comprising:

admixing a particulate coal with a distillable aromatic hydrocarbon solvent having a boiling temperature in the range of from about 400° F. to about 950° F. to form a slurry;

heating the slurry to a temperature level in the range of from about 700° F. to about 1000° F. in the presence of an hydrogen gas while maintaining the slurry at a pressure in the range of from about 1000 psig. to about 5000 psig. to effect a conversion of the coal in the slurry to coal liquefaction products comprising distillable and substantially nondistillable soluble coal products and insoluble coal products in admixture with the distillable aromatic hydrocarbon solvent;

distilling said coal liquefaction products to separate said intermingled distillable aromatic hydrocarbon solvent and distillable soluble coal products from the remainder;

admixing said remainder with a deashing solvent to form a prepared mixture;

separating said prepared mixture into a first light phase and a first heavy phase comprising insoluble coal products and some deashing solvent by maintaining the prepared mixture at a first temperature level in the range of from about 400° F. to about 700° F. and a pressure in the range of from about 600 psig. to about 1500 psig;

heating said first light phase to a second temperature level higher than the first temperature level while maintaining the pressure in the range of from about 600 psig. to about 1500 psig. to effect a separation of said first light phase into a second light phase comprising light soluble coal products and deashing solvent and a second heavy phase comprising heavy soluble coal products and some deashing solvent;

heating said second light phase to a third temperature level higher than the second temperature level while maintaining the pressure in the range of from about 600 psig. to about 1500 psig. to effect a separation of said second light phase into a third light phase and a third heavy phase comprising a fraction rich in basic nitrogen heterocyclic compounds;

admixing a portion of said fraction rich in basic nitrogen heterocyclic compounds with the intermingled distillable aromatic hydrocarbon solvent and distillable soluble coal products recovered from admixture with the coal liquefaction products to form a coal liquefaction solvent having a substantially nondistillable and distillable basic nitrogen heterocyclic compounds content of at least about 5 percent by weight of said coal liquefaction solvent;

contacting said coal liquefaction solvent with a particulate coal at a temperature in excess of about 700° F. in the presence of an hydrogen gas while maintaining a pressure in excess of about 1000 psig. for from about 10 minutes to 3 hours to effect a conversion of said particulate coal and said substantially nondistillable basic nitrogen heterocyclic compounds to coal liquefaction products and distillable basic nitrogen heterocyclic compounds having a boiling point of from about 400° to 1000° F.;

recovering said distillables boiling from 400° to 1000° F. that have been enriched in distillable basic nitrogen heterocyclic compounds; and

recycling said distillables as a coal liquefaction solvent.

4,405,438

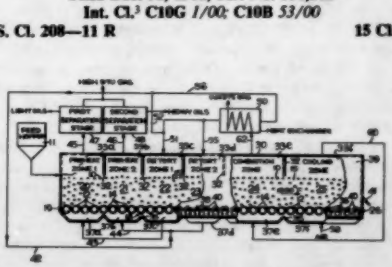
PROCESS FOR RECOVERY OF DIFFERENT WEIGHT FRACTIONS OF OIL FROM SHALE

Bobby P. Faulkner, New Berlin, and Michael H. Weinecke, Franklin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 31, 1981, Ser. No. 336,262

Int. Cl.³ C10G *1/00*; C10B *53/00*

U.S. Cl. 208—11 R **15 Claims**



1. A method of retorting shale particles containing kerogen comprising the steps of

moving a bed of said particles along a generally horizontal path of travel,

passing through said bed at spaced apart points along said path of travel a plurality or discrete streams of nonoxidizing gas free of products of combustion heated to different temperatures sufficiently high to vaporize and educe different gaseous components from the kerogen in said particles as vapors into said gas streams, individually withdrawing said gas streams along said bed, and

separating said different components from said gas streams.

4,405,439

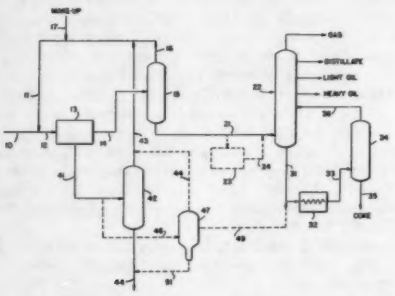
REMOVAL OF QUINOLINE INSOLUBLES FROM COAL DERIVED FRACTIONS

Andre A. Simone, Dover, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 60,453, Jul. 25, 1979, which is a continuation of Ser. No. 819,772, Jul. 28, 1977, abandoned. This application Mar. 13, 1981, Ser. No. 243,484

Int. Cl.³ C10C *1/18, 3/08*

U.S. Cl. 208—45 **5 Claims**



1. A process for reducing the quinoline insoluble content of a coal derived binder pitch, comprising:

contacting a coal tar derived binder pitch feed with a liquid promoter which enhances and promotes the separation of quinoline insolubles, said liquid promoter being a hydrocarbon liquid having a 5-volume percent distillation temperature of at least about 250° F. and a 95-volume percent distillation temperature of at least about 350° F. and no greater than about 750° F., said liquid having a characterization factor of at least 9.75, said liquid promoter being added in an amount to provide a promoter liquid to binder pitch weight ratio of from 0.2:1 to 0.5:1 which is sufficient to recover by gravity settling an overflow stream containing a coal derived binder pitch having less than 0.5 weight percent of quinoline insolubles and in excess of 65% of the non-distillable quinoline soluble components present in the binder pitch feed;

recovering by gravity settling as an overflow stream a mixture of promoter liquid and a coal tar derived binder pitch fraction having less than 0.5 weight percent of quinoline insolubles and in excess of 65% of the non-distillable quinoline soluble components present in the binder pitch feed; and

separating said coal tar derived binder pitch fraction from the promoter liquid.

4,405,440

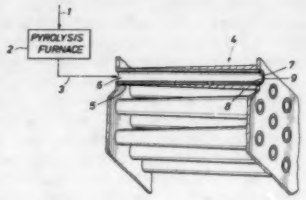
PROCESS FOR MAINTAINING THE TEMPERATURE OF A STEAM-MAKING EFFLUENT ABOVE THE DEW POINT

John E. Gwyn, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1982, Ser. No. 443,369

Int. Cl.³ C10G *9/16, 9/20*

U.S. Cl. 208—48 Q **3 Claims**



2. A process for the pyrolysis of a hydrocarbon liquid comprising,

heating the hydrocarbon liquid in a pyrolysis zone and producing an effluent having a temperature of from about 1400° F. to about 1700° F.;

quenching said effluent by passing said effluent into a quench zone wherein heat is transferred indirectly from the effluent through at least one heat exchange tube wall and through a solid heat transfer medium surrounding and in contact with the tube to water, the temperature of the wall being maintained above the dew point of the materials having a tendency to coke in the effluent partly by the provision of the solid heat transfer medium, the heat transfer medium increasing gradually in thickness from a point at or near the entry of the tube to a point at or near the exit of the tube.

4,405,441

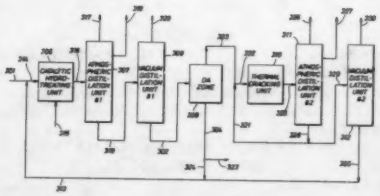
PROCESS FOR THE PREPARATION OF HYDROCARBON OIL DISTILLATES

Robert H. Van Dongen, and John R. Newsome, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 429,780

Int. Cl.³ C10G *49/00*

U.S. Cl. 208—61 **9 Claims**



1. A process for the production of hydrocarbon oil distillates from a hydrocarbon mixture feed stream containing asphaltenes, said process comprising:

(a) catalytically hydrotreating said feed stream in a hydrotreating zone, therein producing a first product stream having a reduced asphaltenes content;

(b) fractionating said first product stream into one or more light distillate fractions and a first heavy distillate fraction;

(c) thermally cracking said first heavy distillate fraction and a deasphalted oil fraction in a thermal cracking zone into

a second product stream containing less than 20 percent by weight C_4 to C_1 hydrocarbons;

(d) fractionating said second product stream into one or more light distillate fractions and a second heavy distillate fraction;

(e) solvent deasphalting said second heavy distillate fraction in a deasphalting zone to obtain a deasphalted oil fraction and an asphaltic bitumen fraction; and

(f) routing at least a portion of said deasphalted oil fraction from step (e) to said thermal cracking zone.

4,405,442

PROCESS FOR CONVERTING HEAVY OILS OR PETROLEUM RESIDUES TO GASEOUS AND DISTILLABLE HYDROCARBONS

Andre Deschamps, Noisy le Roi; Sigismond Franckowiak, and Jean-Francois Le Page, both of Rueil-Malmaison, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Nov. 24, 1982, Ser. No. 444,268

Claims priority, application France, Nov. 24, 1981, 81 21940

Int. Cl.³ C10G *65/12, 47/20*

U.S. Cl. 208—107 7 Claims

1. A process of the conversion of heavy oil or oil residue to gaseous and distillable hydrocarbons, comprising the steps of:

(a) heating to 350°–450° C. a mixture of a heavy oil and/or oil residue charge with a first hydrogenated recycle oil fraction issued from step (g), then admixing it with a reducing gas containing hydrogen, carbon monoxide and steam, introduced at a temperature of at least 800° C. and produced at least partly in step (c), so as to bring the temperature of the resultant mixture charge+gas to a value ranging from 530° to 850° C., and maintaining said mixture within said temperature range, under a pressure of at least 20 bars, for a residence time between 0.1 and 60 seconds,

(b) admixing the resultant product from step (a) with a second hydrogenated recycle oil fraction issuing from step (g) and whose temperature is lower than 300° C., so as to lower the temperature of said product from said value ranging between 530° and 850° C. down to a value lower than 450° C., then directly contacting the resultant product with a gas stream containing hydrogen and steam, obtained from step (f), so as to vaporize at least 80% of the existing liquid at a temperature lower than 450° C., and separating the resultant gaseous phase from an unvaporized tar and/or coke fraction,

(c) treating the heavy fraction of tar and/or coke with oxygen and steam, under the conditions of oxyvapogasification of carbon to convert it at least partly to a reducing gas containing hydrogen, carbon monoxide and steam and feeding back at least a part of said reducing gas, whose temperature is at least 800° C., to step (a),

(d) passing the gaseous phase from step (b) containing hydrogen, carbon monoxide, carbon dioxide, steam and hydrocarbon vapors, over a hydrogenation catalyst, under hydrogenating conditions,

(e) fractionating the products from step (d) to a gaseous phase, an aqueous phase, a fraction of light liquid hydrocarbons normally distilling, at least in major part, below 250° C., and a fraction of heavy liquid hydrocarbons distilling, at least in major part, above 250° C. and whose atomic ratio H/C is from 1.2 to 1.7,

(f) treating the gaseous phase from step (e) so as to remove therefrom at least the major part of the carbon dioxide and hydrogen sulfide contained therein and recycling at least a part of it to step (b),

and

(g) recycling to steps (a) and (b) at least a part of the heavy fraction, distilling in major part above 250° C., obtained in step (e), to constitute at least a portion of said hydrogenated recycle oil streams.

4,405,443

PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS

Ralph J. Bertolacini, Naperville; Eugene H. Hirschberg, Park Forest, and Frank S. Modica, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 29, 1982, Ser. No. 363,269

Int. Cl.³ C10G *11/02*

U.S. Cl. 208—113 22 Claims

1. A process for removing sulfur oxides from a gas which comprises:

(a) absorbing sulfur oxides from the gas with an absorbent which comprises at least one inorganic oxide selected from the group consisting of the oxides of aluminum, magnesium, zinc, titanium, and calcium in association with an oxide of yttrium, at a temperature in the range from about 100° to about 900° C., wherein the ratio by weight of inorganic oxide or oxides to yttrium is from about 1 to about 1000; and

(b) removing said absorbed sulfur oxides from the absorbent as a sulfur-containing gas, which comprises hydrogen sulfide, by contacting said absorbent with a hydrocarbon in the presence of a hydrocarbon cracking catalyst at a temperature in the range from about 375° to about 900° C.

8. In a process for the cycling, fluidized catalytic cracking of a hydrocarbon feedstock containing from about 0.2 to about 6 weight percent sulfur as organic sulfur compounds wherein: (i) said feedstock is subjected to cracking in a reaction zone through contact with a particulate cracking catalyst at a temperature in the range from 430° to 700° C.; (ii) the cracking catalyst, which is deactivated by sulfur-containing coke deposits, is separated from the reaction zone effluent and passes to a stripping zone wherein volatile deposits are removed from said catalyst by contact with a stripping gas comprising steam at a temperature in the range from 430° to 700° C.; (iii) stripped catalyst is separated from stripping zone effluent and passes to a catalyst regeneration zone and non-stripped, sulfur-containing coke deposits are removed from the stripped catalyst by burning with an oxygen-containing regeneration gas at a temperature in the range from 565° to about 790° C., thereby forming sulfur oxide; and (iv) resulting catalyst is separated from regeneration zone effluent gas and recycled to the reaction zone; and wherein emissions of sulfur oxides in the regeneration zone effluent gas are reduced by the method which comprises:

(a) absorbing sulfur oxides in said regeneration zone with fluidizable particulate solids which comprise at least one inorganic oxide selected from the group consisting of the oxides of aluminum, magnesium, zinc, titanium and calcium in association with an oxide of yttrium, wherein said oxide of yttrium and inorganic oxide or oxides are present in the particulate solids in sufficient amount to effect the absorption of at least 50 percent of the sulfur oxides produced by the burning of sulfur-containing coke deposits in the regeneration zone and the ratio by weight of inorganic oxide or oxides to yttrium is from about 1 to about 1,000; and

(b) removing said absorbed sulfur oxides from the fluidizable particulate solids as a sufur-containing gas which comprises hydrogen sulfide and sulfur oxide by contacting said particulate solids with the hydrocarbon feedstock in said reaction zone.

4,405,444

METHOD AND MEANS FOR CHARGING FOAMED RESIDUAL OILS IN CONTACT WITH FLUID SOLID PARTICULATE MATERIAL

Oliver J. Zandona, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 8, 1982, Ser. No. 439,972

Int. Cl.³ C10G *9/28, 11/00, 11/14*

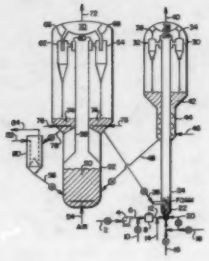
U.S. Cl. 208—113 12 Claims

1. A method for upgrading a high boiling portion of crude oil comprising metallo-organic and Conradson carbon produc-

ing compounds to form gasoline, lower and higher boiling hydrocarbon streams which comprises:

A. charging a high boiling portion of crude oil as a thick foam to the lower portion of a riser conversion zone;

B. charging fluidizable solid particle material at an elevated temperature in the range of 704° C. (1300° F.) up to about 815° C. (1500° F.) in intimate contact with said foamed oil feed to form a suspension thereof,



C. passing said formed suspension through a riser conversion zone under conditions of restricted residence time and temperature promoting desired conversion of the oil feed, and

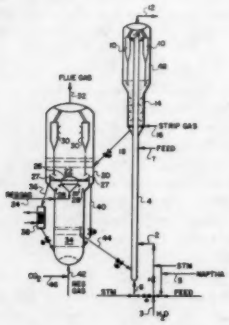
D. recovering a hydrocarbon conversion product separated from catalyst particles following traverse of said riser conversion zone.

4,405,445

HOMOGENIZATION OF WATER AND REDUCED CRUDE FOR CATALYTIC CRACKING

Stephen M. Kovach, and Edward B. Cornelius, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 21, 1981, Ser. No. 295,335
Int. Cl.³ C10G *11/14*
U.S. Cl. 208—120 **28 Claims**



1. A Process for converting carbo-metallic oil feeds to lighter products comprising:

(a) providing a pre-heated carbo-metallic oil feed containing 650° F.+material, said 650° F.+material being characterized by a carbon residue on pyrolysis of at least 1 and containing at least about 4 ppm of Nickel Equivalents;

(b) introducing said feed into a homogenization zone together with liquid water at a weight ratio to feed of about 0.04 to about 0.25, and said zone being pressurized to a pressure in the range of about 100 to about 400 psig;

(c) forming in said zone a homogeneous mixture of said feed and said liquid water;

(d) atomizing said mixture into droplets having an average droplet size in the range of about 1,000 microns to about 100 microns, and introducing said droplets into the bottom of a progressive flow reaction zone for contact with crystalline zeolite cracking catalyst particles to form a suspension thereof at a cracking temperature above 900° F., passing the suspension through a progressive flow reaction zone for a vapor residence time in the range of about 0.5 to about 5 seconds and a pressure of about atmospheric up to about 100 lbs. per square inch gauge, said operating conditions causing oil feed conversion per pass in the range of about 50% to about 90% and depositing hydrocarbonaceous material on the catalyst equivalent to an amount of coke of 14% by weight based on fresh feed;

(e) separating said suspension into a catalyst phase and a vaporous product phase of said cracking at a temperature in the range of about 950° to about 1,200° F.;

(f) stripping vaporous hydrocarbon from said catalyst phase;

(g) regenerating said catalyst phase; and

(h) recycling regenerated catalyst at an elevated temperature to the riser zone.

4,405,446

PREPARATION OF BITUMEN FROTHS AND EMULSIONS FOR SEPARATION

Jan Kruyer, 9707-67A, Edmonton, Alberta, Canada T6B 1S3

Filed Mar. 15, 1982, Ser. No. 338,600
Int. Cl.³ C10G *33/06*
U.S. Cl. 208—188 **11 Claims**

1. A method for preparing a mixture of aqueous phase and oil phase for separation wherein one of said phases is dispersed and the other is continuous which comprises the steps of:

(a) introducing said mixture into a generally horizontal rotating drum containing a hydrocarbon diluent and free bodies that tumble in said drum, at least some of said free bodies having oleophilic surfaces that have affinity for the oil phase of said mixture,

(b) agitating said mixture, diluent and free bodies in said rotating drum such that said free bodies continually mix with said mixture and diluent causing said diluent to unite with the oil phase of said mixture and causing the dispersed phase volumes of said mixture to unite on the surface of the free bodies to which they are attracted and grow into larger sized volumes which are ultimately sloughed off the free bodies to which they have been attracted, and

(c) removing said diluted oil phase and said aqueous phase from said drum for subsequent separation into a separate oil phase product and a separate aqueous phase product.

4,405,447

METHOD FOR THE REMOVAL OF METAL FROM A HYDROCARBON SOLUTION CONTAINING METAL ALKARYL SULFONATE

Lee Hilfman, Mt. Prospect, and John G. Gatsis, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 15, 1982, Ser. No. 358,074
Int. Cl.³ C10G *19/02*
U.S. Cl. 208—251 R **8 Claims**

1. A method for the removal of metal from a hydrocarbon solution containing metal alkaryl sulfonate, which method comprises:

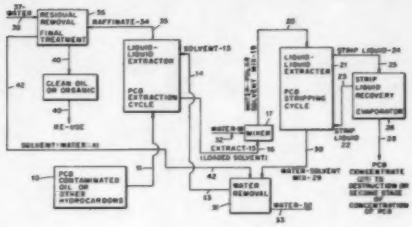
(a) contacting a hydrocarbon solution of metal alkaryl sulfonate with aqueous ammonia or aqueous ammonium salt solution; and

(b) recovering a hydrocarbon having a reduced metal concentration.

4,405,448
PROCESS FOR REMOVING HALOGENATED ALIPHATIC AND AROMATIC COMPOUNDS FROM PETROLEUM PRODUCTS

John M. Googin; John M. Napier, both of Oak Ridge, and Michael A. Travaglini, Oliver Springs, all of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 31, 1982, Ser. No. 364,060
Int. Cl.³ C10G 21/02, 21/12
U.S. Cl. 208—262 8 Claims



1. A process for removing polychlorinated biphenyls from petroleum products by solvent extraction, comprising the steps of:

contacting a petroleum product containing a polychlorinated biphenyl with an adequate volume of a polar solvent selected from the group consisting of dimethyl formamide and furfural for extracting essentially all of the polychlorinated biphenyl frm the petroleum product;

separating the resulting extract phase of the polar solvent and extracted polychlorinated biphenyl from the raffinate phase;

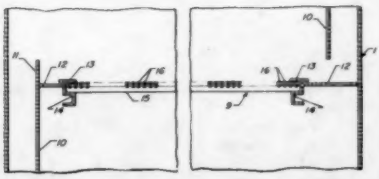
contacting the extract with an adequate volume of water or a polyhydroxy compound to extract the polychlorinated biphenyl from the polar solvent; and

recoverng polar solvent and water or polyhydroxy compound with essentially all of the polychlorinated biphenyl removed therefrom.

4,405,449
PROCESS FOR VAPOR-LIQUID CONTACTING AND FRACTIONAL DISTILLATION

John E. Trager, Arlington Heights, Ill., assignor to Procon International Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 182,355, Aug. 29, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,593
Int. Cl.³ C10G 7/00; B01B 3/22
U.S. Cl. 208—350 12 Claims



1. A vapor-liquid contacting process which comprises:

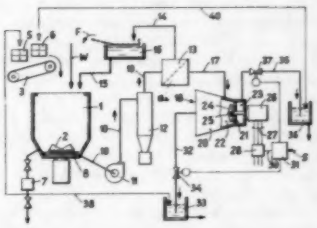
(a) passing a vapor stream upward through a liquid support plate located within a containment vessel having a substantially vertical inner surface, with the liquid support plate having an upper surface and an outer edge which is adjacent to at least a portion of the inner surface of the sidewall of the vapor containment vessel, the liquid support plate having a substantially horizontal vapor-liquid contacting area comprising a plurality of horizontal parallel members having an upper surface possessing a width of between about 0.15 and about 0.55 cm and being uniformly spaced apart by a distance between about 0.022 and about 0.080 cm, and with the parallel members being shaped such that the smallest distance between any two adjacent parallel members is located at the upper surface of the adjacent parallel members and the distance between the vertically sloping sides of adjacent parallel members is at least twice as large at the bottom of the adjacent parallel members as at the top of adjacent parallel members; and,

(b) passing a liquid stream across the vapor-liquid contacting area of the liquid support plate in a direction which is substantially perpendicular to the parallel members of the vapor-liquid contacting area while the liquid and the vapor streams are maintained at contacting conditions.

4,405,450
METHOD FOR FRACTIONATING FIBER STOCK OBTAINED FROM WASTE PAPER AND APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

Harald Selder, Schlier, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Württ, Fed. Rep. of Germany

Filed Sep. 9, 1981, Ser. No. 300,632
Claims priority, application Switzerland, Oct. 3, 1980, 7391/80
Int. Cl.³ D21D 5/04; B07B 1/04; B03B 7/00
U.S. Cl. 209—3 11 Claims



1. A method of fractionating fiber stock obtained from waste paper by means of a sieve device to which there is infed a cleaned fiber stock suspension freed of heavy and light contaminants and which contains longer and shorter stock fibers which are to be separated from one another, comprising the steps of:

utilizing as the sieve device a structure containing a housing with a sieve arranged therein having a size of its sieve holes in the order of 0.8 to 2.4 millimeters diameter;

providing the sieve device with a rotor driven by a drive motor and with said rotor containing arms;

moving said arms along the sieve;

providing a long fiber chamber at the side of the sieve confronting the rotor;

connecting an infeed line for the fiber stock suspension so as to flow communicate with said long fiber chamber;

directing a long fiber line out of the long fiber chamber into operative communication with a long fiber container;

forming behind the sieve a short fiber chamber;

leading a short fiber line out of the short fiber chamber into a short fiber container;

providing a throttle element in at least one of said lines; and

controlling said throttle element as a function of the viscosity of the fiber stock suspension located forwardly of the sieve and within the long fiber chamber and thus the power consumption of the rotor in a manner such that

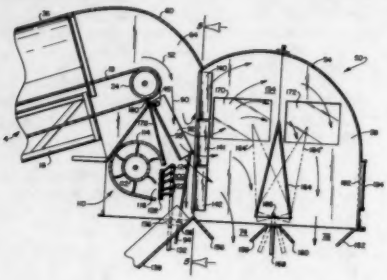
with increasing viscosity and increasing power consumption of the rotor the flow in the long fiber line leading from the long fiber chamber is intensified and with decreasing viscosity and decreasing power consumption of the rotor the flow in the long fiber line leading from the long fiber chamber is diminished.

4,405,451

AIR SEPARATION APPARATUS AND SYSTEM

Walter C. Roman, Worthington, Ohio, assignor to BancOhio National Bank, Columbus, Ohio

Filed Oct. 20, 1981, Ser. No. 313,160
Int. Cl.³ B07B *4/02*
U.S. Cl. 209—136 **31 Claims**



1. Apparatus for carrying out the air separation of waste having plastic categorized materials, biodegradable categorized materials and metal and glass categorized materials said waste being continuously transported by a conveyor to a terminus thereof at an elevated location to fall therefrom as a particle stream, comprising:

a housing having an input top wall portion extending over said conveyor terminus and a pair of mutually spaced first sidewall portions extending from said input top wall portion substantially adjacent said falling particle stream, said housing having plenum wall components and including an arcuate top wall portion extending from said input top wall portion substantially at said terminus level and coupled with a spaced pair of second sidewall portions to define a plenum;

fan means for producing a stream of air at an outlet thereof, said outlet being positioned within said housing intermediate said first sidewall portions and spaced from and below said terminus;

airstream guidance means for directing said fan means stream of air along a select direction toward said plenum substantially upwardly into lifting confrontation with said particle stream and toward said plenum arcuate top wall portion;

means positioned intermediate said fan means outlet and said conveyor for restricting air flow therebetween;

first outlet means positioned below the said level of said fan means and in substantial alignment with said terminus for receiving said metal and glass categorized materials;

second outlet means located against said first outlet means and beneath said plenum for receiving said biodegradable categorized materials;

third outlet means located adjacent said second outlet means and beneath said plenum for receiving said plastic categorized material;

deflector means mounted within said housing plenum intermediate said second and third outlet means and extending toward said arcuate top wall portion for selectively adjusting the flow of air within said plenum and deflecting said biodegradable categorized material toward said second outlet means; and

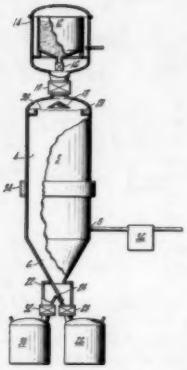
means defining openings within said plenum wall components for effecting air back pressure dissipation.

4,405,452

METHOD FOR SEPARATING PARTICULATE MATERIALS

J. Michael Wentzell, Remsen, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 753,160, Dec. 21, 1976, abandoned.
This application Nov. 22, 1978, Ser. No. 963,074
Int. Cl.³ B03B *5/44*
U.S. Cl. 209—172 **3 Claims**



1. In separating contaminant and oxide particulate materials of a density of about 2.3 gm/cc or greater from a particulate material which is metal of a density of about 8 gm/cc, the steps of:

(a) providing as a separation medium a substance which is a gas under ambient temperature and pressure, selected from the inert gas group consisting of nitrogen, neon, argon, krypton, or mixtures thereof, being substantially nonreactive in the liquid or gaseous state with said metal particulate;

(b) containing the separation medium in a pressure vessel and maintaining a pressure and temperature within the vessel which causes the separation medium to be a liquid;

(c) placing the particulate material in the medium within the pressure vessel to separate the particulates as the lighter materials float and the heavier materials sink therein;

(d) removing the separated particulate materials from the pressure vessel,

(e) allowing any separation medium residue on the particulates to volatilize, the materials thereupon being clean and free of any residue or contamination as a result of the nonreactivity and gaseous nature of said medium.

4,405,453

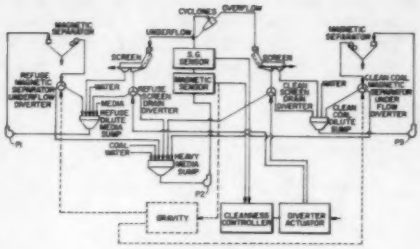
PROCESS FOR CLEANING UNDESLIMED COAL

Charles H. Wells, Portola Valley, Calif., assignor to Envirotech Corporation

Filed Feb. 23, 1982, Ser. No. 351,384
Int. Cl.³ B03B *5/34*
U.S. Cl. 209—172.5 **2 Claims**

1. An improved process for cleaning a coal mixture to remove ash particles and slime particles therefrom, wherein the mixture is fed to a cyclone to separate the mixture into an overflow fraction containing coal mixture and slime particles and an underflow fraction including ash particles and slime particles, and wherein a magnetic heavy media suspension such as magnetite and water is mixed with the coal mixture to enhance separation within the cyclone, the improvement comprising sensing the bulk specific gravity of the feed mixture

containing the coal and heavy media suspension being fed to the cyclone, sensing the percentage magnetic material in said feed mixture, deriving a set-point value of the cross-correlation function of sensed values of the percentage of magnetic materials and the specific gravity at points in time immediately subsequent to start-up, continuously separating heavy media suspension from the underflow fraction from the cyclone, continu-



ously mixing a portion of separated suspension with further coal mixture to be cleaned, generally continuously determining the value of cross-correlation function of the feed mixture containing the separated suspension, and reducing the portion of the separated suspension mixed with further coal when the subsequently determined value is less than the set-point value to thereby correspondingly reduce the slime content of the feed mixture.

4,405,454

PROCESS AND APPARATUS FOR THE DEWATERING OF SOLIDS IN SUSPENSION

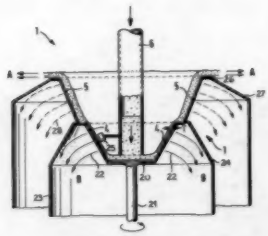
Günther Hultsch, Oberschleissheim; Franz Alstetter, Karlsfeld, and Uwe Breuer, Grobenzell, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 259,097

Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020211

Int. Cl.³ B01D *37/00;* **B04B** *3/00*

U.S. Cl. 209—279 **4 Claims**



1. In an apparatus for dewatering a slurry containing solids in a particle size range of 0.05 mm to 2.0 mm and in which the solids are classified into a fine fraction and a coarse fraction, the fine fraction is filtered, and the coarse fraction is dewatered, the improvement which comprises:

a centrifuge drum formed with at least one first sieve surface inclined so as to enable a thin-layer classification zone of solids to form thereon in a thickness of about 5 mm, and a second sieve surface outwardly of said first sieve surface and receiving said coarse fraction therefrom;

means for maintaining said layer at said thickness on said first sieve surface;

means for feeding said slurry onto said first surface whereby particles of said fine fraction pass through perforations in said first surface thereby classifying the solids into said coarse and fine fractions; and

means for separately collecting said fine fraction and water from said first surface, water passing through perforations in said second surface, and the coarse fraction following dewatering on said second surface.

4,405,455

ADSORPTION SEPARATION APPARATUS

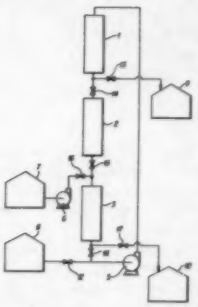
Masao Ando, Musashino; Tetsuya Hirota, Fujisawa, and Katashi Shioda, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Division of Ser. No. 90,133, Nov. 1, 1979, Pat. No. 4,332,623. This application Jan. 6, 1982, Ser. No. 337,522

Claims priority, application Japan, Nov. 2, 1978, 53-135312; Dec. 28, 1978, 53-163720; Mar. 13, 1979, 54-29126

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—191 **8 Claims**



1. An adsorption separator consisting of first to third three packed sections wherein an adsorbent is packed and which are connected in series, the front end of the first packed section being communicated with the rear end of the third packed section through a fluid passage so that a fluid is able to be circulated through the respective packed sections, at least one pump mounted in the circulating system;

a first valve means located between said first and second packed sections, whereby fluid flow between said first and second packed sections can be controlled;

a second valve means located between said second and third sections, whereby fluid flow between said second and third packed sections can be controlled;

an inlet port for a starting fluid which is located between said second valve means and the front end of said third section, said inlet port being connected to a source of starting fluid through a third valve means whereby the flow of said starting fluid may be controlled;

a port for introducing a desorbent fluid into the separator which is located between the rear end of the third packed section and the front end of the first packed section, said port being connected to a source of desorbent fluid through a fourth valve means whereby the flow of said desorbent fluid may be controlled;

a first port for withdrawing a first fluid from the separator which is located between the rear end of the first packed section and said first valve means, said first port being connected to a first fluid receptacle through a fifth valve means whereby the flow of said first fluid may be controlled;

a second port for withdrawing a second fluid from the separator which is located between the rear end of the third packed section and the front end of the first packed section and upstream of the port for introducing a desorbent fluid and a sixth valve means is provided in the fluid passage between the said second port and said port for

introducing a desorbent fluid to prevent the backward flow of fluid in said fluid passage, said second port being connected to a second fluid receptacle through a seventh valve means whereby the flow of said second fluid may be controlled.

4,405,456

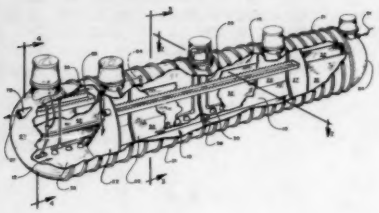
CLARIFIER APPARATUS

Jay Kinzer, Denver, and John W. Clingman, Aurora, both of Colo., assignors to Sanilogical Corporation, Denver, Colo.

Filed Aug. 25, 1981, Ser. No. 296,019

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—195.4 **6 Claims**



1. A clarifier apparatus for use in connection with a sewage treatment system to separate biological solids from mixed liquor in the system to produce a clarified effluent, comprising:

a sewage treatment system fluidly communicating with said clarifier

first tank means defining a first quiescent zone, inlet means for supplying mixed liquor from the sewage treatment system to the first quiescent zone,

second tank means defining a chamber,

baffle means in the chamber for separating the chamber into an aeration zone and a second quiescent zone,

gas supply means for supplying an oxygen containing gas to a lower portion of the aeration zone,

first fluid communication means for withdrawing partially clarified effluent from an upper portion of the first quiescent zone and supplying the partially clarified effluent to the aeration zone in the treatment chamber of the second tank means,

second fluid communication means providing fluid communication between the aeration zone and the second quiescent zone,

and outlet means for withdrawing clarified effluent from an upper portion of the second quiescent zone.

4,405,457

PLATE-TYPE FILTER PRESS WITH A CLEANING TRUCK

Oswald Busse, and Hugo Klesper, both of Aarbergen, Fed. Rep. of Germany, assignors to Passavant-Werke AG & Co. KG, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,141

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043821

Int. Cl.³ B01D *25/12*

U.S. Cl. 210—225 **8 Claims**

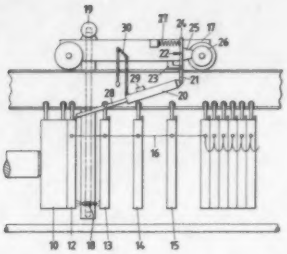
1. In a plate-type filter press having a plurality of slidable filter plates transportable longitudinally of the filter press toward an open side of the press and in an opposite direction toward a closed side of the press,

(a) distance limiting element means for connecting adjacent filter plates to each other and for providing that transport of each filter plate to said open side of the press moves the next filter plate into an intermediate position for cleaning,

(b) a self-propelled cleaning truck means mounted for movement along a guide member in the direction of transport of the filter plates,

(c) an extensible drive and pusher carried by said cleaning truck means with said pusher being extensible through a stroke by said drive in the direction of transport of said filter plates selectively into and out of engagement with each filter plate to be transported toward said open side of the press,

(d) a releasable brake means carried by said cleaning truck means for holding said cleaning truck means in a fixed position while said brake means is in an engaged position



and for permitting movement of said cleaning truck means upon release of said brake means,

(e) means urging said brake means toward said engaged position for holding said cleaning truck means in said fixed position during transport of each said filter plate toward said open side of the press and during retraction of said pusher, and

(f) brake release means operatively connecting said drive and pusher to said brake means for releasing said brake means in response to further extension of said pusher after completing the transport of each said filter plate to said open side of the press.

4,405,458

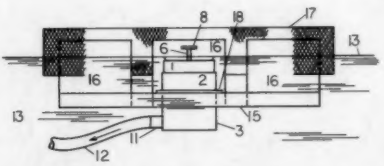
CONTINUOUS FLOW, VARIABLE CAPACITY SELF-COMPENSATING FLOATING WEIR

Leo A. McHugh, Jr., 2044 Brownsville Rd., Pittsburgh, Pa. 15210

Filed Apr. 29, 1980, Ser. No. 144,967

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—242.3 **4 Claims**



1. A continuous flow, variable capacity self-compensating, floating weir apparatus for use in both fixed and mobile, free floating applications for separating liquids of different densities, for removing surface borne debris, films, scums and similar types of contaminants from liquid bodies in tanks, settlement ponds, manufacturing and waste treatment processes, rivers, lakes and other large bodies of water, and for regulating the transfer flow of liquid from one body to another comprising:

a. a float supported, vertically moveable weir collar which forms a positively bouyant weir having a weir surface for control of liquid flow,

b. a guide collar fitted to nest with, but unattached to, said

moveable weir collar to control orientation and guide movement of said moveable weir collar, said guide collar in conjunction with said weir collar forming a continuous combined liquid seal and lubricating film for restriction of bypass liquid flow and for free, unrestrained movement of said weir collar;

c. guide means for maintaining vertical, radial, rotational and central alignment of said weir collar within said guide collar,

d. means for vertically adjusting and controlling the elevation of said weir collar,

e. means for limiting the elevation of said weir collar and for retaining said weir collar within said guide collar,

f. flange means being arranged to provide strength, support, and alignment of said guide collar,

g. and a sump with a discharge connection for collecting and discharging liquid flowing over said weir surface, said weir collar being supported by and responsive to the liquid in said sump.

4,405,459

OILY WATER SEPARATOR

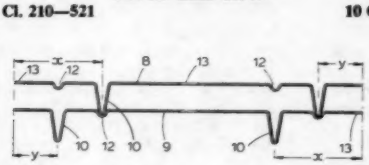
Peter B. Smith, 11, Leverton Gate, Broome Manor, Swindon, Wiltshire, England

Continuation-in-part of Ser. No. 199,466, Aug. 19, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,680

Claims priority, application United Kingdom, Dec. 19, 1978, 49120/78

Int. Cl.³ B01D *21/00*

U.S. Cl. 210—521 **10 Claims**



1. An oil/water separator which has a stack of parallel plates between which an oil/water mixture is constrained to flow, the plates being separated in said stack one from the other by spacing means provided thereon, the spacing means defining alternative first and second predetermined spacings, either of which may be selected between any two adjacent plates of the stack.

4,405,460

PROCESS AND DEVICE FOR SEPARATING MIXTURES OF MATTER IN THE LIQUID PHASE

Dieter Disselbeck, Bad Soden am Taunus, and Klaus Speier, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 19, 1981, Ser. No. 265,343

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019355

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—640 **5 Claims**

1. In a device for separating mixtures of matter by the use of radiant solar energy, the matter being in the liquid phase, in the form of a flat, hollow body having an upper wall and a lower wall, and being constructed of a material that is liquid-tight; comprising a lower cavity having a lower wall constituted by the body lower wall and a liquid-tight upper wall; a middle cavity having as a lower wall thereof the upper wall of the lower cavity and an upper wall which is liquid-tight but vapor-permeable; an upper cavity having as a lower wall thereof the vapor-permeable upper wall of the middle cavity and as an upper wall thereof the body upper wall; a fluid inlet communicating with the lower cavity; a residue outlet communicating with the upper cavity; a product outlet communicating with the second cavity; and a bridging conduit bridging said middle cavity and communicating with said upper and lower cavities; the improvement wherein the upper wall of the upper cavity includes means for absorbing solar radiation; and said upper and lower walls of said upper and lower cavities are formed of fabric, with the upper and lower walls of each of said upper and lower cavities being joined by spacers in the form of filaments.

4,405,461

CONTROL OF SILICA SCALING IN INDUSTRIAL PROCESSES

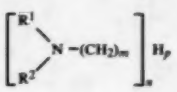
Alfred N. Rogers, 5333 Mallard Dr., Pleasanton, Calif. 94566

Filed Mar. 26, 1982, Ser. No. 362,225

Int. Cl.³ C02F *5/12*

U.S. Cl. 210—698 **12 Claims**

1. A method of controlling silica scaling in lines and plant equipment through which silica-containing water or brine flows comprising: providing an additive formed from



where m=0 or 1, n=1 or 2 such that m=1 when n=2, p=0 or 1 such that p+n=2, R^1 and R^2 are the same or different and are selected from the group consisting of furfuryl and a saturated or unsaturated hydrocarbon radical substituted with one or more members selected from hydroxy or a hydrohalide thereof; and directing the additive into silica-containing water or brine.

4,405,462

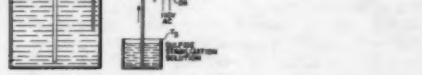
AUTOMATIC REVITALIZATION OF SULFIDE PROCESSING AND TREATMENT SOLUTIONS

David R. Kamperman, Harmony, Pa., assignor to Lancy International, Inc., Zelienople, Pa.

Filed Aug. 9, 1982, Ser. No. 406,561

Int. Cl.³ C02B *1/20*

U.S. Cl. 210—709 **16 Claims**



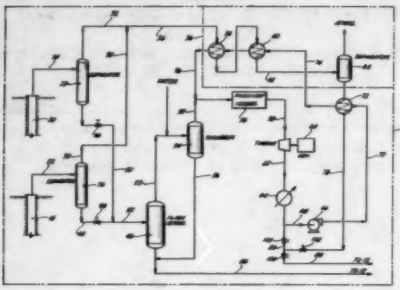
1. A process for constantly maintaining a desired concentration of soluble sulfides in a processing solution such as in an effluent or rinse water containing heavy metal contaminants to be removed which comprises, continuously withdrawing a specimen solution from the sulfide processing solution and mixing it with a sulfide stabilizing solution to provide a mixed specimen solution, employing the mixed specimen solution to proportionately energize a pair of electrodes in accordance with the soluble sulfide content of the mixed specimen solution, and employing the energy thus generated to controllably supply sulfide regenerating solution to the processing solution to maintain the soluble sulfide content thereof.

4,405,463

PROCESS FOR STABILIZING SILICA-RICH GEOTHERMAL BRINE TO PREVENT SILICA SCALING

John W. Jost, Santa Ana; William C. Lieffers, Fullerton, and Olin D. Whitescarver, Indian Wells, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 4, 1981, Ser. No. 318,127
Int. Cl.³ C02F 1/52, 1/74
U.S. Cl. 210—712 35 Claims



1. A process for removing dissolved silica from a geothermal aqueous liquid also containing ferrous ions and having a pH of about 4.5 to 6.0, which comprises the steps of:

(a) providing a controlled supply of ferric ions, including containing said ferrous ions in said geothermal aqueous liquid with an oxidizing agent so as to oxidize at least a portion of said ferrous ions to ferric ions;

(b) allowing at least some of said ferric ions to combine with dissolved silica in said geothermal aqueous liquid so as to lower the pH of said geothermal aqueous liquid and form insoluble, iron-rich siliceous materials; and

(c) separating said insoluble, iron-rich siliceous materials from said geothermal aqueous liquid so as to form a stabilized geothermal aqueous liquid having a reduced silica content and a pH of about 3 to 5.

23. The silica removal process defined in claims 1 or 18 wherein said step of contacting said ferrous ions with an oxidizing agent results in forming hydrogen ions, thereby causing pH of said stabilized geothermal brine to be lower than pH of said untreated geothermal brine wherein said process further comprises the step of reducing the pH of said untreated geothermal brine by combining a portion of said stabilized geothermal brine with said untreated geothermal brine.

4,405,464

PROCESS FOR THE REMOVAL OF SELENIUM FROM AQUEOUS SYSTEMS

Roger A. Baldwin, Warr Acres; John C. Stauter, and Donald L. Terrell, both of Edmond, all of Okla., assignors to Kerr-McGee Nuclear Corporation, Oklahoma City, Okla.

Filed Aug. 31, 1981, Ser. No. 297,634
Int. Cl.³ C02F 1/52, 1/70
U.S. Cl. 210—717 8 Claims

1. A process comprising:

providing an aqueous solution containing selenium ions in the Se(VI) oxidation state;

providing a quantity of metallic iron;

adjusting the pH level of said aqueous solution to a level below about 6.0;

admixing said aqueous solution and metallic iron to reduce at least a portion of said selenium ions in the Se(VI) oxidation state to at least the Se(IV) oxidation state and oxidize a portion of said metallic iron and dissolve said oxidized portion of said metallic iron in said aqueous solution;

hydrolyzing at least a portion of said dissolved oxidized iron to form ferric hydroxide that precipitates from said aqueous solution; and

separating at least a portion of said aqueous solution from at least a portion of said precipitated ferric hydroxide, said separated aqueous solution having a reduced concentration of selenium ions in the Se(VI) and lower oxidation states.

4,405,465

PROCESS FOR THE REMOVAL OF CHLORATE AND HYPOCHLORITE FROM SPENT ALKALI METAL CHLORIDE BRINES

Sanders H. Moore, and Ronald L. Dotson, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 30, 1982, Ser. No. 393,578
Int. Cl.³ C25B 1/34
U.S. Cl. 210—757 10 Claims

1. A process for reducing the concentration of oxyhalogen impurities in an alkali metal halide brine recovered from an electrolytic cell which comprises:

(a) circulating the alkali metal halide brine to a treatment zone outside of said electrolytic cell; and

(b) acidifying said alkali metal halide brine to maintain a pH in the range of from about 0 to about 2;

(c) admixing oxalic acid with said alkali metal halide brine to produce a purified brine having a substantially reduced concentration of said oxyhalogen impurities; and

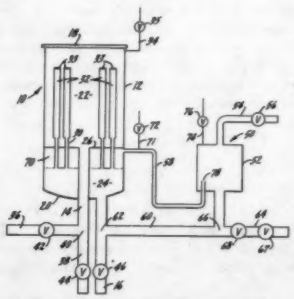
(d) recovering said purified brine from said treatment zone.

4,405,466

BACKWASH METHOD AND APPARATUS

Joseph F. Giannelli, Glen Rock; George C. Flynn, Chester, and Leo F. Ryan, Bridgewater, all of N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed May 3, 1982, Ser. No. 374,350
Int. Cl.³ B01D 29/38
U.S. Cl. 210—798 11 Claims



1. A method for cleaning a plurality of filter elements having inner cores vertically positioned within a filter vessel which has a tube sheet dividing the filter vessel into an upper filter compartment and a lower plenum compartment, said filter elements being positioned within said filter compartment and having fittings which extend through said tube sheet downwardly into said plenum compartment, said method comprising: draining at least a portion of the liquid from the filter vessel, establishing a low flow rate of backwash liquid through a backwash inlet line into the plenum compartment continuing through the filter elements; and intermittently directing gas under pressure through a gas supply line in communication with an external vessel containing a volume of cleaning liquid for forcing a predetermined volume of the cleaning liquid from the external vessel under gas pressure at a high flow rate into the plenum compartment and through the filter elements such that the total volume of cleaning liquid directed through the

filter elements during each cycle is in the range of 1.0 to 3.0 times the total filter element core void volume.

8. Apparatus for filtering liquids comprising: a filter vessel; a tube sheet dividing said vessel into an upper filter compartment and a lower plenum compartment; a plurality of filter element fittings extending through said tube sheet and downwardly into said plenum compartment; a plurality of filter elements vertically mounted on said fittings in said filter compartment; an external vessel positioned outside of said filter vessel at an elevation at or below the elevation of the tops of said fittings; a gas supply line in communication with an upper portion of said external vessel; a backwash liquid inlet line in communication with a lower portion of said plenum compartment and a lower portion of said external vessel; and a gas surge line in communication with a lower portion of said external vessel and an upper portion of said plenum compartment.

4,405,467

SUBLIMABLE COMPOSITIONS AND PROCESS FOR PRODUCING MOLDINGS

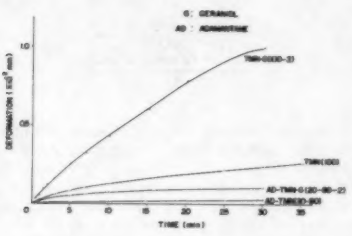
Haruhito Sato; Hiroshi Ichikawa; Hiroshi Hayashi, and Konomu Kurisaki, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Division of Ser. No. 862,624, Dec. 20, 1977, Pat. No. 4,301,043. This application Jul. 30, 1981, Ser. No. 288,410

Claims priority, application Japan, Dec. 25, 1976, 51-155651; Dec. 25, 1976, 51-155653; May 21, 1977, 52-58220; May 24, 1977, 52-59359; Jun. 7, 1977, 52-66298; Oct. 17, 1977, 52-123460

Int. Cl.³ C09K *3/00*; A61K *7/46*

U.S. Cl. 252—1 **11 Claims**



1. A process for producing a sublimable molded article which comprises melt-molding a composition comprising (i) adamantane and (ii) at least one compound selected from the group consisting of endo-trimethylenenorbornane and cyclododecane.

9. A sublimable multi-layer molded article comprising (i) adamantane; (ii) at least one compound selected from the group consisting of endo-trimethylenenorbornane and cyclododecane; and (iii) an effective component which is at least one compound selected from the group consisting of α-ionone, borneol, camphor, linalool, geraniol, cumarin, nerolin, citronillol, morpholine, thymol, dicyclohexylamine and diisopropylamine, wherein the ratio of the effective component contained in each layer is successively increased from the outer layer to the inside or inner layer.

4,405,468

PLACID SHALE WEIGHTING AGENT FOR WATER BASE DRILLING MUD

R. P. Haun, Jr., P.O. Box 712, Eastland, Tex. 76448

Filed Mar. 12, 1981, Ser. No. 243,032

Int. Cl.³ C09K *7/04*

U.S. Cl. 252—8.5 B **2 Claims**

1. A drilling mud comprising a slurry mixture of water, a gel viscosifier, and a dispersed clay as a weighting agent consisting essentially of chlorite, illite and kaolinite mineral components, said drilling mud having a solids concentration in the range of 1.5% to 7.27%, said mineral components being present in the following amounts:

Mineral Component	Approximate % By Weight
chlorite	7%
illite	62%
kaolinite	31%

and said clay being characterized by the following analysis:

Component	Approximate % By Weight	Approximate % By Weight (volatile free)
Silicon dioxide, SiO_2	65.07%	69.32%
Iron oxide, Fe_2O_3	5.78%	6.15%
Aluminum oxide, Al_2O_3	16.75%	17.24%
Calcium oxide, CaO	1.12%	1.19%
Magnesium oxide, MgO	2.08%	2.22%
Sulfur troxide, SO_3	1.29%	1.37%
Sodium oxide, Na_2O	0.42%	0.47%
Potassium oxide, K_2O	1.36%	1.44%
Volatiles	6.13%	

4,405,469

GREASES PREPARED FROM ORGANOSILOXANES WITH SIC-BONDED GROUPS

Walter Hafner, Furth; Erich Markl, Munich; Ludwig Eibel, Munich; Gerhard Kreis, Munich; Dietrich Samrowski, Munich; Manfred Wick, Schliersee; Bernward Deubzer, Burghausen, and Wilhelm Friedrich, Munich, all of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Ind. GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 68,114, Aug. 20, 1979, Pat. No. 4,322,473, which is a division of Ser. No. 15,551, Feb. 26, 1979, Pat. No. 4,207,246. This application Jul. 27, 1981, Ser. No. 286,798

Int. Cl.³ C10M *3/02*

U.S. Cl. 252—28 **4 Claims**

1. A lubricating composition comprising an organosiloxane having at least one unit of the formula

$$ROOCCH_2CH(COOR)CH_2CHR'CH_2Si(CH_3)_aO_{\frac{3-a}{2}}$$

in which R is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 12 carbon atoms which are free of aliphatic unsaturation and monovalent hydrocarbon radicals having one ether oxygen atom, R' is selected from the group consisting of hydrogen and a CH_3 radical and a is 0, 1 or 2, and sufficient thickening agent to form a grease.

4. The lubricating composition of claim 1, wherein the thickening agent is selected from the group consisting of polytetrafluoroethylene, polyurea, phthalocyanine, clay, silicon dioxide and a metallic soap.

4,405,470

PHOSPHORODITHIOATE PRODUCTS OF HYDROCARBYL IMINO-METHYLENE-SUBSTITUTED HINDERED PHENOLS

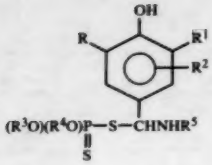
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 22, 1982, Ser. No. 341,718

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—32.7 E **18 Claims**

1. A compound of the formula



wherein R, R^1, R^2, R^3, R^4 and R^5 are hydrocarbyl groups containing from 1 to 30 carbon atoms.

4,405,471

AQUEOUS METAL-WORKING LUBRICANT

Mans O. Manson; Carl-Axel E. Sjögreen, and Göran A. Bergvall, all of Perstorp, Sweden, assignors to Perstorp AB, Perstorp, Sweden

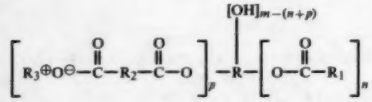
Filed Feb. 23, 1981, Ser. No. 237,479

Claims priority, application Sweden, Feb. 29, 1980, 80015837

Int. Cl.³ C10M *3/26*

U.S. Cl. 252—34 **4 Claims**

1. A water dilutable metal-working lubricant composition, comprising an emulsion or an aqueous solution containing 1–30% by weight of a compound having the formula



wherein

R is an alkyl radical containing 3–15 carbon atoms;

R_1 is an alkyl radical, an unsaturated hydrocarbon radical or an aryl radical containing 4–30 carbon atoms;

R_2 is an alkyl radical, an unsaturated hydrocarbon radical, an aryl radical or an alicyclic radical containing 1–20 carbon atoms;

$R_3\oplus$ is a protonized amine or an alkali metal cation;

m has a value between 3 and 8;

n<m; and

p has a value between 0.5 and 8;

and 99–70% by weight of water.

4,405,472

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

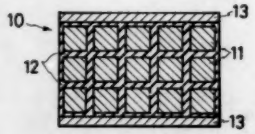
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,773

Claims priority, application Japan, Dec. 8, 1981, 56-197312

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 95.18 to about 99.65 percent by weight $SrTiO_3$, from about 0.33 to about 3.32 percent by weight Ta_2O_5, and from about 0.02 to about 1.50 percent by weight CuO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with resepect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.75 percent by weight PbO, from about 0.11 to about 4.22 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,473

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

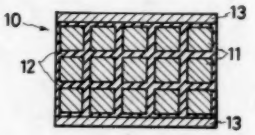
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,774

Claims priority, application Japan, Dec. 16, 1981, 56-201692

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 94.50 to about 99.62 percent by weight $SrTiO_3$, from about 0.33 to about 3.00 percent by weight Ta_2O_5, and from about 0.05 to about 2.50 percent by weight ZnO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.8 percent by weight PbO, from about 0.11 to about 4.38 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,474

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,775

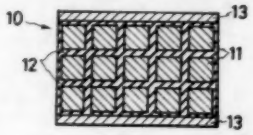
Claims priority, application Japan, Dec. 16, 1981, 56-201693

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**

1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed

throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 96.70 to about 99.83 percent by weight $SrTiO_3$, from about 0.15 to about 2.30 percent by weight WO_3, and from about 0.02 to about 1.00 percent by weight CuO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to



100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.83 percent by weight PbO, from about 0.10 to about 4.30 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,475

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

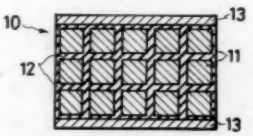
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,776

Claims priority, application Japan, Dec. 11, 1981, 56-200499

Int. Cl.³ C04B *35/46;* H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 91.18 to about 99.82 percent by weight $SrTiO_3$, from about 0.13 to about 5.32 percent by weight Nb_2O_5, and from about 0.05 to about 3.50 percent by weight ZnO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.90 percent by weight PbO, from about 0.11 to about 4.28 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,476

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

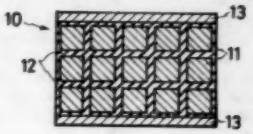
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,777

Claims priority, application Japan, Dec. 8, 1981, 56-197313

Int. Cl.³ C04B *35/46;* H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 94.50 to about 99.82 percent by weight $SrTiO_3$, from about 0.13 to about 2.50 percent by weight WO_3, and from about 0.05 to about 3.00 percent by weight GeO_2, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.90 percent by weight PbO, from about 0.10 to about 4.28 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,477

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

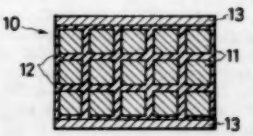
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Kazuji Onigata, Annaka, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1980, Ser. No. 443,780

Claims priority, application Japan, Dec. 16, 1981, 56-201694

Int. Cl.³ C04B *35/46;* H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 91.92 to about 99.62 percent by weight $SrTiO_3$, from about 0.33 to about 4.08 percent by weight Ta_2O_5, and from about 0.05 to about 4.00 percent by weight GeO_2, the secondary ingredients consisting essentially

of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.02 to about 2.83 percent by weight PbO, from about 0.11 to about 4.33 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,478

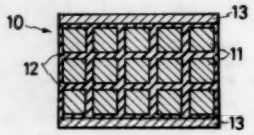
DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,781

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 90.68 to about 99.88 percent by weight $SrTiO_3$, from about 0.07 to about 5.32 percent by weight of Nb_2O_5, and from about 0.05 to about 4.00 percent by weight GeO_2, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.90 percent by weight PbO, from about 0.11 to about 4.34 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the seconary ingredients.

4,405,479

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Masayuki Fujimoto, Hachiyamamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

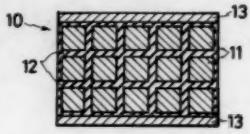
Filed Nov. 22, 1982, Ser. No. 443,782

Claims priority, application Japan, Dec. 4, 1981, 56-195439

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**

1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 95.20 to about 99.80 percent by weight $SrTiO_3$, from about 0.15 to about 2.30 percent by weight WO_3, and from about 0.05 to about 2.50 percent by weight ZnO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about



0.03 to about 2.75 percent by weight PbO, from about 0.11 to about 4.23 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,480

DIELECTRIC CERAMIC MATERIALS WITH INSULATED BOUNDARIES BETWEEN CRYSTAL GRAINS, AND PROCESS FOR PREPARATION

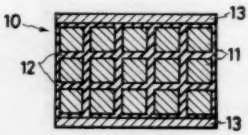
Kiyoshi Murase, Takasaki; Nobutatsu Yamaoka, Harunamachi, and Kazuji Onigata, Annaka, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,783

Claims priority, application Japan, Dec. 16, 1981, 56-201695; European Pat. Off., Sep. 28, 1982, 82108979.4

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 252—62.3 BT **1 Claim**



1. An insulated boundary layer ceramic having primary and secondary ingredients forming in combination a polycrystalline ceramic proper, and insulating substances dispersed throughout the intergranular boundaries of the ceramic proper, the primary ingredients consisting essentially of, in relative proportions, from about 93.18 to about 99.85 percent by weight $SrTiO_3$, from about 0.13 to about 5.32 percent by weight Nb_2O_5, and from about 0.02 to about 1.50 percent by weight CuO, the secondary ingredients consisting essentially of from about 0.02 to about 0.10 part by weight SiO_2 and from about 0.01 to about 0.03 part by weight Al_2O_3 with respect to 100 parts by weight of the primary ingredients, the ratio in weight of SiO_2 to Al_2O_3 being from about 1.5 to about 5.0, and the insulating substances consisting essentially of from about 0.03 to about 2.75 percent by weight PbO, from about 0.12 to about 4.23 percent by weight Bi_2O_3, and from about 0.001 to about 0.18 percent by weight B_2O_3, the percentages of the insulating substances being all with respect to the total weight of the primary and the secondary ingredients.

4,405,481

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada; Nobuo Tsuji, both of Odawara; Tsutomu Okita, Fujinomiya, and Yasuo Mukunoki, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 24, 1980, Ser. No. 220,215
Claims priority, application Japan, Dec. 28, 1979, 54-173625
Int. Cl.³ B05D 5/12
U.S. Cl. 252—62.54 9 Claims

1. A magnetic recording medium containing one or more ferromagnetic powders, one or more binders and a lubricant, said lubricant comprising (1) non-magnetic abrasive particles having a Mohs' hardness of about 6 or more and a particle size of about 5 microns or less and (2) one or more esters selected from the group consisting of ethyl erucate, butyl erucate, butoxyethyl erucate, butyl behenate, butoxyethyl behenate, octyl behenate and 2-ethylhexyl behenate.

4,405,482

SANITIZING FORMULATION

Russell A. Hayes, Castle Hill, Australia, and Gerard Duve, Slough, England, assignors to Richardson-Vicks Pty. Limited, New South Wales, Australia

Filed Aug. 31, 1981, Ser. No. 297,919
Claims priority, application Australia, Sep. 1, 1980, PE5356
Int. Cl.³ C11D 7/56
U.S. Cl. 252—99 6 Claims

1. A sanitizing and bleaching composition comprising by weight percent the following:

(a) from 5 to 95% of a peroxy hydrate compound;
(b) from 2 to 25% of a non-phosphate water softener containing the citrate ion;
(c) from 0.1 to 5% of a source of magnesium ion as a partial hydrogen peroxide stabilizer;
(d) from 0.01 to 5% of a chelating agent for transition metals;
(e) from 0 to 5% of sodium polymetaphosphate; and
(f) from 0.1 to 8% of a nonionic surfactant.

4,405,483

STABLE LIQUID DETERGENTS CONTAINING ALUMINOSILICATE ION EXCHANGE MATERIAL

Maryann Kuzel, and John W. Leikhim, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 27, 1982, Ser. No. 372,349
Int. Cl.³ C11D 1/72, 3/12, 11/00, 17/08
U.S. Cl. 252—140 13 Claims

1. A process for preparing a stable liquid detergent composition comprising:

(a) from about 5% to about 40% by weight of a detergent surfactant;
(b) from about 3% to about 30% of a finely divided aluminosilicate ion exchange material selected from the group consisting of:
(i) crystalline aluminosilicate material of the formula

$$Na_z[(AlO_2)_z.(SiO_2)_y].xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from about 1.0 to about 0.5 and x is from about 10 to about 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg $CaCO_3$ eq./g and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram/gallon;
(ii) amorphous hydrated aluminosilicate material of the empirical formula $M_z(zAlO_2.ySiO_2)$ wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1 and said material has a magnesium ion exchange capacity of at least about 50 milligrams equivalents of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon; and
(iii) mixtures thereof;
(c) from about 1% to about 30% by weight of a water-soluble detergency builder capable of sequestering calcium and magnesium ions in water solution, selected from the group consisting of water-soluble polycarboxylates, polyphosphonates, polyphosphates, and mixtures thereof;
(d) from about 3% to about 25% by weight of a stabilizing agent selected from the group consisting of hydrophilic surface active agents having an HLB value greater than about 14 and hydrophobic emulsifiers having an HLB value less than about 8.5; and
(e) from about 30% to about 88% water; said composition containing less than about 60% by weight of the detergent surfactant, aluminosilicate material and water-soluble detergency builder; said process comprising dispersing the aluminosilicate material in an aqueous solution having a pH less than 7 to partially gelatinize the aluminosilicate material, and mixing the dispersion with the balance of the detergent ingredients to provide a stable composition having a pH greater than 7.

4,405,484

ZEOLITE POWDER HAVING HIGH FLOWABILITY, PROCESS FOR PREPARING SAME AND DETERGENT COMPOSITION CONTAINING SAME

Hiroshi Miyazaki, Shin Nanyo, and Junji Arika, Tokuyama, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin Nanyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,073
Claims priority, application Japan, Aug. 12, 1980, 55/109814
Int. Cl.³ C11D 3/12; C01B 33/28
U.S. Cl. 252—174.25 11 Claims

1. A process for the preparation of finely divided zeolite powders of high flowability in which at least 99% by weight of the zeolite particles have a particle size of about 1 to 5 microns, which comprises the steps of:

(1) adding about 0.1 to about 1.5 parts by weight (as Al_2O_3) of an alkali metal aluminate to 100 parts by weight (as the anhydride) to an aqueous zeolite slurry containing 30 to 52% by weight of zeolite as calculated as the anhydride and having a pH of not higher than 12.8;
(2) adjusting the pH of the slurry to a value not higher than 11; and then,
(3) drying the slurry.

11. A detergent composition comprising, based on the total weight of the composition, 1 to 50% by weight of at least one surface active agent and 1 to 60% by weight of a zeolite, said zeolite being a finely divided powder of high flowability which is represented by the formula:

$$Na_2O.Al_2O_3.nSiO_2.wH_2O$$

wherein n is number of from 1.8 to 3.0 and w is a number of from 1 to 6, and which comprises at least 99% by weight of particles having a particle size of 1 to 5 microns and has an aerated bulk density of from 0.3 to approximately 0.5 g/cc, a degree of cohesiveness of from 0 to 56%, and the general flow index expressed as the sum of indexes of the repose angle, spatula angle, compressibility and degree of cohesiveness is in the range of from 30 to approximately 50, said zeolite powder prepared by the process of claim 1.

4,405,485

ION SELECTIVE COMPOSITION

Roger N. Sargent, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 25, 1968, Ser. No. 700,654
Int. Cl.³ C02F 5/10
U.S. Cl. 252—180 4 Claims

1. A composition of matter capable of removal of cations from water and the concentration of such cations which com-

prises a cellulose substrate containing precipitated $NaAl(SiO_3)_2$ or $KAl(SiO_3)_2$ therein.

4,405,486

METHOD FOR PREPARING GRANULATED PERBORATE SALTS CONTAINING A POLYMERIC FLUOROCARBON

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 297,892, Aug. 31, 1981, Pat. No. 4,362,639, which is a continuation-in-part of Ser. No. 251,030, Apr. 3, 1981. This application May 20, 1982, Ser. No. 380,164

Int. Cl.[3] **B01J** *2/22, 2/28;* **C11D** *7/28, 7/54*

U.S. Cl. 252—186.31 **18 Claims**

1. A method for preparing a granulated perborate salt, comprising:

A. forming a mixture of said perborate salt with a polymeric fluorocarbon, said mixture containing said polymeric fluorocarbon in an amount by weight of said perborate salt, of from about 0.01% to about 0.70%;

B. compacting said mixture into a plurality of preforms; and

C. comminuting said preforms under agitation, to form said granulated perborate salt.

10. A granulated perborate salt product, suitable for inclusion in a compactible composition, said product comprising a precompressed mixture of said perborate salt and from about 0.1% to about 0.70% of a polymeric fluorocarbon.

4,405,487

COMBINATION MOISTURE AND HYDROGEN GETTER

Larry A. Harrah, Albuquerque; Keith E. Mead, Peralta, both of N. Mex., and Henry M. Smith, Overland Park, Kans. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Apr. 29, 1982, Ser. No. 373,076

Int. Cl.[3] **C01B** *3/56;* **H01J** *7/18;* **B01D** *53/34*

U.S. Cl. 252—194 **23 Claims**

1. A combination moisture and hydrogen getter composition, comprising:

(a) a moisture getter comprising a readily oxidizable metal and characterized by having standard oxidation potential relative to hydrogen in water within the range of about 0.049 to 1.86; and

(b) a hydrogen getter comprising (i) a solid acetylenic compound and (ii) a hydrogenation catalyst.

4,405,488

LIQUID-CRYSTALLINE HALOGENOBENZENE DERIVATIVES

Shigeru Sugimori; Tetsuhiko Kojima, and Masakazu Tsuji, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

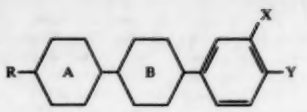
Filed Sep. 16, 1981, Ser. No. 302,517

Claims priority, application Japan, Oct. 9, 1980, 55-141536; Oct. 14, 1980, 55-143394; Oct. 24, 1980, 55-149053; Oct. 29, 1980, 55-151772; Jan. 7, 1981, 56-1029; Jan. 7, 1981, 56-1030; Feb. 14, 1981, 56-20566; Mar. 4, 1981, 56-30812; Mar. 13, 1981, 56-36148; Mar. 28, 1981, 56-46065; Apr. 8, 1981, 56-52566; Apr. 9, 1981, 56-53700

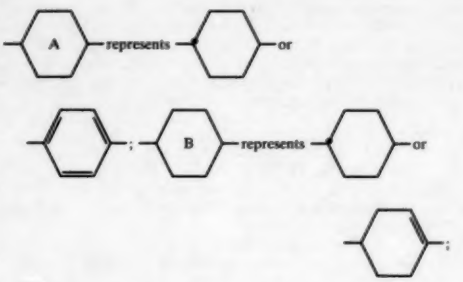
Int. Cl.[3] **G02F** *1/13;* **C09K** *3/34;* **C07C** *25/18*

U.S. Cl. 252—299.63 **9 Claims**

1. A liquid-crystalline halogenobenzene compound expressed by the formula



wherein R represents an alkyl group having 1 to 10 carbon atoms;



and X and Y each are H, F or Cl, at least one of X and Y being F or Cl.

4,405,489

PRODUCTION OF A POST-FOAMING GEL AND SYSTEM THEREFOR

Frederick P. Sisbarro, Wayne, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Jan. 15, 1981, Ser. No. 225,389

Int. Cl.[3] **B01J** *13/00;* **B01F** *5/04, 13/06*

U.S. Cl. 252—315.4 **26 Claims**

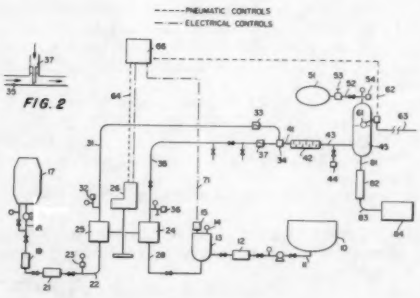


FIG. 2

1. A process for continuously producing a post-foaming gel for packaging thereof comprising:

admixing separately metered amounts of an aqueous soap ingredient and a post-foaming agent to form an intimate mixture thereof; passing said mixture to a filling machine for packaging the gel, said steps being effected in a continuous flow system under pressure, said mixture being maintained within the continuous flow system for a time and at a pressure and temperature sufficient to produce a post-foaming gel capable of continuously flowing through the system to the filling machine for packaging thereof.

20. A system for continuously producing a post-foaming gel for packaging thereof, comprising:

a supply means for an aqueous soap ingredient; a supply means for a post-foaming agent, a first metering means for metering

an aqueous soap ingredient from the supply means therefor; a second metering means for metering a post-foaming agent from the supply means therefor; mixing means; a pressurized tank; filling means for introducing a post-foaming gel into a package therefor; first fluid flow means for connecting the first metering means to said mixing means; second fluid flow means for connecting the second metering means with the first fluid flow means to mix the aqueous soap ingredient with the post-foaming agent for mixing in the mixing means; third fluid flow means connecting the mixing means with the pressurized tank; fourth fluid flow means connecting the pressurized tank with the filling means whereby the mixture of aqueous soap ingredient and post-foaming agent flows to the filling means through the pressurized tank and is formed into a post-foaming gel prior to the filling means; a supply tank for pressurized gas; and means for introducing pressurized gas from the supply tank into the pressurized tank to pressurize the pressurized tank and at least the portion of the system from the mixing means to the filling means.

4,405,490

ANTI-FOAM FORMULATION CONTAINING AN ORGANOPOLYSILOXANE

Joachim Maas, Bergheim; Helmut Steinberger, Leverkusen, and Hans-Heinrich Moretto, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,253

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3013923

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—358 **6 Claims**

1. An anti-foam composition comprising by weight approximately

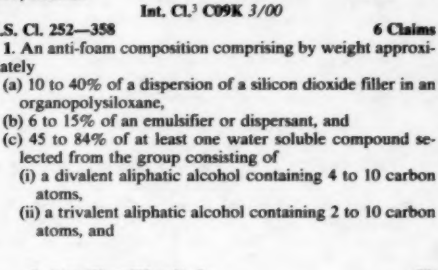
(a) 10 to 40% of a dispersion of a silicon dioxide filler in an organopolysiloxane,

(b) 6 to 15% of an emulsifier or dispersant, and

(c) 45 to 84% of at least one water soluble compound selected from the group consisting of

(i) a divalent aliphatic alcohol containing 4 to 10 carbon atoms,

(ii) a trivalent aliphatic alcohol containing 2 to 10 carbon atoms, and



(iii)

in which

R_1 and R_2 each independently is hydrogen, C_{1-8}-alkyl or C_{1-8}-alkyl-CO-, and

n,m,p,o and r are so chosen that the molecular weight of (c) does not exceed 425.

4,405,491

APPARATUS FOR FORMING FOAM

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Tokyo, Japan

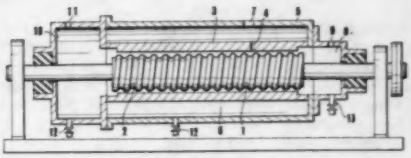
Filed Sep. 29, 1981, Ser. No. 306,768

Claims priority, application Japan, Oct. 2, 1980, 55-140970[U]; Oct. 17, 1980, 55-148148[U]

Int. Cl.³ B01F *3/04, 7/12*

U.S. Cl. 252—359 E **1 Claim**

1. An apparatus for forming foam for use in continuously applying a treating solution to a cloth, comprising an axially elongated hollow cylinder having a circular interior surface, an axially extending rotatable screw shaft located within said cylinder with the outer surface of said shaft spaced closely from the interior surface of said cylinder, said shaft having spirally extending convex stripes on the outer surface thereof with the radially outer surfaces of said stripes spaced closely inwardly from the radially inner surface of said hollow cylinder, and said cylinder having axially extending grooves formed in and extending radially outwardly from the inner surface thereof, and means for passing a treating solution including a foaming agent such as soap together with pressurized air through the space between the outer surface of the screw shaft and the inner surface of the cylinder, said grooves formed in the inner surface of said cylinder are rectangularly shaped in cross-section extending transversely of the axial direction of said cylinder and said grooves are spaced angularly apart around the inner surface of said cylinder, said convex stripes extend almost perpendicularly to the axis of said cylinder and



include a relatively short axially extending frusto-conical first section extending inwardly from the end of one stripe followed by a longer axially extending frusto-conical second section extending generally outwardly to the radial outer surface of an adjacent stripe with a generally cylindrically shaped axially extending top located in the radially outer surface of said screw shaft and abutting said first section of the following stripe, the axis of said cylinder is horizontally arranged, said means comprises a fluid supply opening through said cylinder adjacent one end of said screw shaft for supplying a treating solution containing a foaming agent along with pressurized air into the space between said screw shaft and said cylinder, said cylinder forming a foam tank at the other end of said screw shaft, a foam outlet extending through said cylinder from said foam tank with said foam outlet located in the upper part of said foam tank, and a drain outlet through said cylinder from the bottom of said foam tank.

4,405,492

PROCESS FOR MAKING HIGH-GLYCERIN SOAP BARS

John D. Nyquist, Fairfield; Gary K. Kwasniewski, Cincinnati; Arthur W. Thornton, Cincinnati; Paul E. Vest, Cincinnati, and Kenneth E. Ducklo, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1982, Ser. No. 360,128

Int. Cl.³ C11D *9/26, 13/10, 13/18*

U.S. Cl. 252—370 **5 Claims**

1. A process for making milled soap bars containing 2% to 25% glycerin, the said process comprising the steps of:

A. Providing a source of soap, dried to an overall moisture content of from about 8% to about 12% and containing particles of soap which are overdried and therefore harder than the remainder of the soap;

B. Mechanically working the soap by milling it or extruding it through a soap refining screen so as to break up the overdried soap particles and homogeneously distribute the overdried soap throughout the soap mass;

C. Mixing glycerin into the soap mass;

D. Mechanically working the mixture formed in Step (C) by milling it or extruding it through a soap refining screen;

E. Plodding the worked mixture of Step (D) into a log; and

F. Cutting the said log into segments and stamping the segments into the desired bar shape.

4,405,493

CORROSION INHIBITORS, METHOD OF PRODUCING THEM AND PROTECTIVE COATINGS CONTAINING THEM

David A. Pippard, Hampton Hill, England, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 15, 1980, Ser. No. 112,349

Claims priority, application United Kingdom, Feb. 3, 1979, 793860

Int. Cl.³ C09D 5/08; C23F 11/18

U.S. Cl. 252—389 A 8 Claims

1. A corrosion inhibitor consisting of particles of up to 100 microns diameter of an inorganic oxide having corrosion-inhibiting anions selected from the group consisting of phosphate, chromate or benzoate chemically bound to the particles by ion exchange, whereby said anions bound to said particles can only be released by further ion exchange.

4,405,494

POLYHYDROXY-POLYALKYLENE-POLYAMINE SALTS OF MALEIC AMIDE ACIDS AS CORROSION INHIBITORS IN WATER-IN-OIL EMULSIONS

Knut Oppenlaender; Erich Schwartz, both of Ludwigshafen; Klaus Barthold, Mannheim, and Wilhelmus Slotman, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

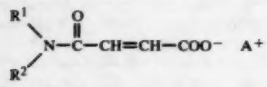
Filed Dec. 10, 1981, Ser. No. 329,381

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047304

Int. Cl.³ C23F 11/14, 11/12

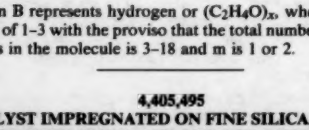
U.S. Cl. 252—392 20 Claims

1. A corrosion inhibitor compound for use in preventing the corrosion of iron and metals containing iron in contact with water-in-oil emulsions, said corrosion inhibitor having the formula



I

wherein R^{11} is an alkyl radical having 7 to 20 carbon atoms, R^2 represents hydrogen or R^1 and A^+ represents the protonized radical of an amine having the formula



II

wherein B represents hydrogen or $(C_2H_4O)_x$, wherein x is an integer of 1–3 with the proviso that the total number of C_2H_4O radicals in the molecule is 3–18 and m is 1 or 2.

4,405,495

CATALYST IMPREGNATED ON FINE SILICA, PROCESS FOR PREPARING, AND USE FOR ETHYLENE POLYMERIZATION

Kiu H. Lee, South Charleston, W. Va., and Gary S. Cieloszyk, Somerville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1980, Ser. No. 163,959

Int. Cl.³ C08F 4/02, 4/64

U.S. Cl. 252—429 B 25 Claims

1. In a catalyst composition for copolymerizing ethylene with one or more C_3 to C_8 alpha olefins at a productivity level of $\leqq$5 ppm of titanium per million parts of copolymer comprising a precursor composition of the formula

$$Mg_mTi_1(OR)_nX_p[ED]_q$$

wherein

R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR′ wherein R′ is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical,

X is selected from the group consisting of Cl, Br, I or mixtures thereof,

ED is an electron donor compound,

m is $\geqq$0.5 to $\leqq$56,

n is 0, 1 or 2,

p is $\geqq$2 to $\leqq$116, and

q is $\geqq$2 to $\leqq$85,

said precursor composition being impregnated in a porous support in a weight ratio of 0.1:1 to 0.33:1 and being either unactivated, or

partially activated with >0 to <10 mols of activator compound per mol of Ti in said precursor composition or completely activated with $\geqq$10 to $\leqq$400 mols of activator compound per mol of Ti in said precursor composition,

said activator compound having the formula

$$Al(R'')_cX'_dH_e$$

wherein X′ is Cl or OR‴, R″ and R‴ are the same or different and are C_1 to C_{14} saturated hydrocarbon radicals, d is 0 to 1.5, e is 1 or 0 and c+d+e=3,

and said electron donor compound being a liquid organic compound in which said precursor composition is soluble and which is selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones,

the improvement which comprises employing as said support silica having a particle size distribution within the range of from 2 microns to 80 microns and an average particle size of from 20 microns to 50 microns.

4,405,496

HYDROFORMYLATION CATALYST AND PROCESS OF USING IT

Chao-Yang Hsu, Media, Pa., assignor to Sun Tech. Inc., Philadelphia, Pa.

Division of Ser. No. 327,867, Dec. 7, 1981. This application Dec. 20, 1982, Ser. No. 450,945

Int. Cl.³ B01J 31/22

U.S. Cl. 252—429 R 5 Claims

1. A catalyst useful for hydroformylation characterized by the formula $Pt(Acetylacetonate_2/mMX_2.nH_2O/xPR_3$ where M is a Group IVA metal, X is a halogen atom, m is an integer from about 2 to about 10, n is 0 or 2, x is an integer from about 5 to about 20, and PR_3 is a phosphine where R is an alkyl or, aryl group.

4,405,497

CATALYST SYSTEM CONTAINING A FLUORINATED ACID AND A POLYVALENT TIN COMPOUND

Chung I. Young, Roseville, and Loren L. Barber, Jr., Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 213,118, Dec. 4, 1888, abandoned, which is a continuation of Ser. No. 76,557, Sep. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 906,744, May 17, 1978, abandoned. This application Mar. 5, 1982, Ser. No. 355,178

Int. Cl.³ B01J 31/12, 31/26; C07C 43/12; C08G 18/50

U.S. Cl. 252—431 R 9 Claims

1. A catalyst system comprising

(i) a fluorinated acid selected from the group consisting of bis(fluorinated aliphatic sulfonyl)alkanes, and acids of the formula H_mXF_{n+m} wherein X is selected from the group consisting of arsenic and antimony; m is 0 or 1; and n is 5; and

(ii) a polyvalent tin compound having the formula

wherein

g is 0 or 1

R^5 and R^6 are the same or different and are selected from saturated and unsaturated aliphatic and aromatic hydrocarbyl groups containing from 1 to about 10 carbon atoms;

R^7 is selected from the group consisting of oxygen and saturated and unsaturated aliphatic and aromatic hydrocarbyl groups containing from 1 to about 10 carbon atoms, provided that when R^7 is oxygen, then g is 0; and

R^8 is selected from the group consisting of fluorine, acyloxy groups containing less than about 10 carbon atoms, saturated aliphatic hydrocarbyl groups containing from 1 to about 10 carbon atoms and

provided that when R^5, R^6 and R^7 are each saturated aliphatic hydrocarbyl groups then R^8 is selected from the group consisting of fluorine, acyloxy groups containing less than about 10 carbon atoms and

2. A catalyst system according to claim 1 comprising (i) said bis(fluorinated aliphatic sulfonyl) alkane and (ii) said polyvalent tin compound.

4. A catalyst system according to claim 2 wherein said polyvalent tin compound is selected from the group consisting of diphenyl dibutyl tin, diallyl dibutyl tin, divinyl dibutyl tin, tributyl tin fluoride, triphenyl tin acetate, dibutyl tin oxide, and bis(tributyl tin oxide).

5. A catalyst system according to claim 2 wherein said bis(-fluorinated aliphatic sulfonyl) alkane is selected from

bis(trifluoromethylsulfonyl)methane
bis(difluorochloromethylsulfonyl)methane
tris(trifuloromethylsulfonyl)methane
bis(trifluoromethylsulfonyl)-4-bromophenylmethane
bis(trifluoromethylsulfonyl)-2-thienylmethane
bis(trifluoromethylsulfonyl)chloromethane
bis(trifluoromethylsulfonyl)benzylmethane
bis(trifluoromethylsulfonyl)phenylmethane
bis(trifluoromethylsulfonyl)-1-naphthylmethane
bis(perfluorobutylsulfonyl)methane
bis(2,2,3,3,4,4,4-heptafluorobutylsulfonyl)methane
perfluorobutylsulfonyltrifluoromethylsulfonylmethane
1,2,2,3,3,4,4,4-hepatafluorobutyltrifluoromethylsulfonylmethane
ethyl 6,6-bis(perfluoromethylsulfonyl)-4-bromohexanoate
methyl 4,4-bis(perfluoromethylsulfonyl)-2-carbomethoxy-2-bromobutanoate
ethyl 4,4-bis(perfluoromethylsulfonyl)-2-carboethoxy-2-nitrobutanoate
1,1,3,3-tetra(trifluoromethylsulfonyl)propane and
1,1-bis(trifluoromethylsulfonyl)octadecane.

4,405,498

OXIDATION AND AMMOXIDATION CATALYSTS

Jerry R. Ebner, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 104,625, Dec. 17, 1979, abandoned. This application Apr. 14, 1981, Ser. No. 254,231

Int. Cl.³ B01J *21/02, 27/14, 27/02, 29/16*

U.S. Cl. 252—432 **17 Claims**

1. A catalyst for oxidation and ammoxidation of hydrocarbons comprising catalytic elements having the empirical formula

$$BiMo_aV_bSb_c[M_d]O_x$$

wherein a is from 0.5 to 2, b is from 0.12 to 3, c is from 0.12 to 10, and x is taken to satisfy the valence requirements of the other elements present said catalyst being prepared by forming a mixture containing a preformed vanadium antimonate component and a bismuth molybdate component forming said mixture into dry particles, and calcining at a temperature of from 500° to 850° C.

4,405,499

ZEOLITE-RUTHENIUM-BORANE CATALYST COMPOSITION

Wen-Ghih Tsang, Framingham, Mass., and Lynn H. Slaugh, Cypress, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1982, Ser. No. 410,298

Int. Cl.³ B01J *29/12, 21/02*

U.S. Cl. 252—432 **2 Claims**

1. A catalyst composition prepared by a process which comprises:

a. ion-exchanging the sodium ions of the sodium form of a faujasite type zeolite with ruthenium ions by contacting said zeolite with a solution containing a soluble ruthenium compound,

b. calcining the ruthenium exchange zeolite in nitrogen at a temperature ranging from about 300° C. to about 600° C.

c. contacting the ruthenium-containing zeolite with hydrogen at a temperature ranging from about 300° C. to about 600° C. whereby the ruthenium is reduced to the metal,

d. contacting the ruthenium metal-containing zeolite with a solution of borane,

e. calcining the borane treated zeolite in nitrogen at a temperature ranging from about 300° C. to about 400° C. and then

f. contacting the borane-treated zeolite with hydrogen at a temperature ranging from about 300° C. to about 400° C.

4,405,500

HALOGEN COMPOUND PROMOTED AL_2O_3 AND/OR SIO_2 FOR THE PREPARATION OF ISOALKENES

Hans J. Müller, Leverkusen; Helmar Hönig, Hamburg, and Werner Horlitz, Dormagen, all of Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,711

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048693; Apr. 29, 1981, 3117053; Sep. 19, 1981, 3137383

Int. Cl.³ B01J *27/08, 27/12, 21/02;* **C07C** *11/02*

U.S. Cl. 252—433 **19 Claims**

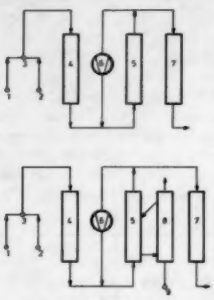
1. A catalyst comprising an Al_2O_3 and/or SiO_2 containing 0.1 to 20% by weight, relative to the quantity of Al_2O_3 and/or SiO_2, of at least one halogen compound of an element of the third to fifth main groups and/or second to eighth sub-groups of the Mendeleen periodic system and/or a hydrogen halide acid which catalyst has been prepared by a process comprising:

(a) calcining an aluminum hydroxide and/or aluminum oxide hydrate and/or silica gel having a content of about 10–70% by weight relative to dried aluminum hydroxide and/or aluminum oxide hydrate and/or silica gel of volatile ammonium salts absorptively bonded whereby to

provide Al_2O_3 and/or SiO_2 by expulsion of the volatile ammonium salts;

(b) contacting the resultant Al_2O_3 and/or SiO_2 with a halogen compound of an element of the third to fifth main groups and/or second to eighth sub-groups of the periodic system and/or a hydrogen halide acid.

2. A catalyst according to claim 1, wherein after contact of said Al_2O_3 and/or SiO_2 with said halogen compound or hydrogen halide acid the Al_2O_3 and/or SiO_2-containing catalyst is calcined.



4. A catalyst according to claim 3, which has a particle size of 0.05 to 10 mm.

5. A catalyst according to claim 1 wherein said resultant Al_2O_3 and/or SiO_2 is treated with a halogen compound of aluminum, boron, tin, germanium, titanium, arsenic, antimony, bismuth, zinc, cadmium, lanthanum, vanadium, tungsten, iron, cobalt, or nickel or a hydrogen halide acid.

4,405,501

AGING OF CHROMIUM-CONTAINING GEL AT HIGH PH

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1982, Ser. No. 340,938

Int. Cl.³ B01J *21/08, 23/26*

U.S. Cl. 252—452 **25 Claims**

1. A process comprising:

forming a co-gelled silica-chromium hydrogel;

aging said hydrogel for a time of at least one hour;

maintaining a pH of said hydrogel during at least a major portion of said aging at a value within the range of 7 to 9; and

treating said hydrogel with a volatile liquid organic compound to remove water and thus convert said hydrogel to a xerogel, said chromium being present in an amount to give 0.001 to 10 weight percent chromium based on the weight of said xerogel.

14. A catalyst produced by the method of claim 1.

15. A process comprising:

forming a silica, titania, chromium tergel hydrogel, said chromium coming from a coordination chromium compound having a nitrogen-containing group;

aging said hydrogel for at least one hour; and

treating said hydrogel with a volatile liquid organic compound to remove water and thus convert said hydrogel to a xerogel.

25. A method according to claim 15 wherein said chromium compound is selected from

(a) compounds of the formula $CrX_3.yNH_3$ where X is a halogen ion selected from Cl^-, Br^-, I^-[31] and y is an integer ranging from 1 to 6;

(b) chromammines containing 6 neutral groups of the formula $[CrA_6]Z_3$ in which A is selected from NH_3, ethylenediamine and unsymmetrical propylenediamine provided further that a portion of A can be H_2O and Z is an acid radical selected from Cl^-, Br^-, I^-, NO_3^-, SO_4^{-2} and PO_4^{-3};

(c) chromammine compounds containing 5 neutral groups of the formula: $[CrA_5Y]Z_2$ where A and Z are as before and Y is a radical from a monobasic acid selected from Cl^-, Br^-, I^-, NO_2^-, NO_3^-, OH^- and CNS^-; and

(d) chromammine compounds containing 5 neutral groups of the formula $[CrA_5W]V$ where A is as before, V is Cl^-, Br^-, I^-, $(OH)^-$, and W is a radical from a dibasic acid selected from SO_3^{-2}, SO_4^{-2}, CO_3^{-2} and $C_2O_4^{-2}$.

4,405,502

CRYSTALLINE CHROMOSILICATE CATALYTIC COMPOSITIONS

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 69,236, Aug. 23, 1979, Pat. No. 4,299,808, which is a continuation-in-part of Ser. No. 927,843, Jul. 25, 1978, abandoned, which is a continuation of Ser. No. 733,269, Oct. 18, 1976, abandoned. This application Jul. 9, 1981, Ser. No. 281,828

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ B01J *29/00, 29/04*

U.S. Cl. 252—455 R **26 Claims**

1. A catalytic composition which comprises a crystalline chromosilicate and a porous refractory inorganic oxide, said chromosilicate and said refractory inorganic oxide having been intimately admixed with one another, said chromosilicate comprising a molecular sieve material providing an X-ray diffraction pattern comprising the following X-ray diffraction lines and assigned strengths:

Interplanar Spacing d, A	Assigned Strengths
11.15 ± 0.2	W
9.96 ± 0.2	VS
5.99 ± 0.1	VW
5.71 ± 0.1	VW
4.97 ± 0.1	W
3.85 ± 0.07	M
3.82 ± 0.07	MS
3.75 ± 0.05	M
3.32 ± 0.05	VW
1.99 ± 0.02	W

and having the following composition in terms of mole ratios of oxides:

$$0.9 \pm 0.2\ M_{2/n}O:Cr_2O_3:YSiO_2:ZH_2O,$$

wherein M is at least one cation having a valence of n, Y is a value within the range of about 4 to about 500, and Z is a value within the range of 0 to about 160.

4,405,503

PRODUCTION OF ZEOLITE AGGLOMERATES

John L. Barclay, Tadworth; John D. Hargrove, Aldershot, and Richard J. Prince, Hampton, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 18, 1981, Ser. No. 322,579

Claims priority, application United Kingdom, Nov. 21, 1980, 8037491

Int. Cl.³ B01J *37/00, 29/18*

U.S. Cl. 252—455 Z **8 Claims**

1. A method for the preparation of a strengthened agglomerate based on a zeolitic molecular sieve which method comprises treating the agglomerate with an aqueous solution of a water soluble silicon compound characterised by the fact that the zeolitic molecular sieve is subsequently treated with an aqueous solution of a mineral acid of sufficient strength to

decationize the molecular sieve and/or increase its SiO_2:Al_2O_3 ratio.

3. A method according to either of the preceding claims wherein the mineral acid is sulphuric or hydrochloric acid.

7. A method according to claim 1 wherein after the mineral acid treating step, the resulting agglomerate is impregnated with a hydrogenating component which is a Group VIII metal.

4,405,504

CATALYTIC COMPOSITIONS

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 69,236, Aug. 23, 1979, Pat. No. 4,299,808, which is a continuation-in-part of Ser. No. 927,843, Jul. 25, 1978, abandoned, which is a continuation of Ser. No. 733,269, Oct. 18, 1976, abandoned. This application Jul. 9, 1981, Ser. No. 281,839

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.³ B01J *29/00, 29/04*

U.S. Cl. 423—458 **16 Claims**

1. A catalytic composition which comprises a mixture of a crystalline chromosilicate and an oxide of chromium, said catalytic composition providing an X-ray diffraction pattern comprising the following X-ray diffraction lines and assigned strengths:

Interplanar Spacing d, A	Assigned Strength
11.14 ± 0.2	M
9.89 ± 0.2	VS
3.85 ± 0.07	MS
3.81 ± 0.07	M
3.72 ± 0.05	M
3.63 ± 0.05	M
2.67 ± 0.02	M
2.48 ± 0.02	M

and having the following composition in terms of mole ratios of oxides:

$0.9 \pm 0.2\ M_{2/n}O:Cr_2O_3:YSiO_2:ZH_2O$,

wherein M is at least one cation having a valence of n, Y is a value within the range of about 4 to about 500, and Z is a value within the range of 0 to about 160.

4,405,505

CATALYST FOR THE PREPARATION OF PHTHALIC ANHYDRIDE

Amleto Neri, Bergamo; Lorenzo Capitanio, Mozzo, and Giancarlo Stefani, Gorle, all of Italy, assignors to Alusuisse Italia S.p.A., Milan, Italy

Filed Mar. 25, 1981, Ser. No. 247,357

Claims priority, application Italy, Apr. 2, 1980, 21134 A/80

Int. Cl.³ B01J *21/06, 23/22, 35/02*

U.S. Cl. 252—461 **3 Claims**

1. A catalyst for the preparation of phthalic anhydride by oxidation of ortho-xylol or naphthalene, comprising as the active component thereof a mixture of vanadium pentoxide and titanium dioxide in a 1:5 to 1:20 ratio by weight, said titanium dioxide having more than 50% of the total pore volume thereof with radii in the 500 to 1,500 Angstrom range, said active component being distributed over an inert support or carrier comprising half-rings.

4,405,506

SUPPORTED PLATINUM GROUP METAL CATALYSTS WITH CONTROLLED METAL PENETRATION

Gwan Kim, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,970

Int. Cl.³ B01J *23/10, 23/56, 27/02*

U.S. Cl. 252—462 **28 Claims**

1. A catalyst composition comprising platinum, palladium and rhodium deposited on a refractory inorganic oxide support and having a maximum platinum concentration within 20 microns of the exterior surface of the support, at least about 70 percent of the total platinum located within 100 microns of the external surface of the support, at least about 10 percent of the total palladium located within 20 microns of the external surface of the support, a maximum rhodium concentration within 20 microns of the external surface of the support, at least about 30 percent of the total rhodium located within 20 microns of the external surface of the support, and at least about 40 percent of the total rhodium located at 20 to 100 microns from the external surface of the support.

13. A method of preparing the catalyst composition of claim 1 comprising impregnating a refractory inorganic oxide support with a palladium sulfito complex solution; impregnating the support with a mixture of a platinum sulfito complex solution, a rhodium nitrate solution, and a rhodium sulfito complex solution, said rhodium nitrate solution and rhodium sulfito complex solution being present in the mixture in amounts such that from about 30 to about 70 weight percent of the total rhodium in the mixture is provided by each solution; and activating the impregnated support.

4,405,507

OZONE ABATEMENT CATALYST HAVING IMPROVED DURABILITY AND LOW TEMPERATURE PERFORMANCE

William F. Carr, Monmouth Junction, and James M. Chen, Rahway, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Division of Ser. No. 218,374, Dec. 22, 1980, Pat. No. 4,343,776. This application Apr. 21, 1982, Ser. No. 370,427

Int. Cl.³ B01J *21/04, 23/40, 23/89*

U.S. Cl. 252—466 B **2 Claims**

1. An ozone decomposition catalyst comprising:

(a) a carrier or support consisting of a plurality of spaced catalyst beds or monoliths arranged in series within a reaction zone;

(b) at least one platinum group metal or catalytically-active compound thereof; and (c) at least one nonprecious Group VIII metal oxide or aluminate;

the arrangement of active material favoring exposure to ozone of the platinum group metal component over the nonprecious Group VIII metal oxide or aluminate and wherein about 1.0-7.00 T.O./ft³ Pd or higher is utilized in conjunction with NiO in a weight ratio of 1.0:0.5–5.0.

4,405,508

METHOD OF PRODUCING CERAMIC MATERIAL FOR ZINC OXIDE VARISTORS

Max-Ferdinand Eckel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,150

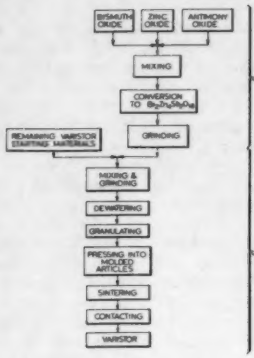
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036617

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 **2 Claims**

1. In a method of producing ceramic materials for zinc oxide varistors wherein such materials contain antimony, which is

added to the initial starting materials as a pentavalent compound, the improvement comprising wherein:



said antimony is added in the form of a pyrochlore compound which has the formula: $Bi_6Zn_4Sb_2O_{18}$.

4,405,509

FRAGRANCE-EMITTING COMPOSITIONS AND ARTICLES

Jack M. Rogers, Tomball, Tex.; Richard Tokosh, Saddlebrook, N.J.; Charles Porter, Harriman, and James Martine, Monroe, both of N.Y., assignors to Avon Products, Inc., New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,043

Int. Cl.³ A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 A **8 Claims**

1. A fragrance-emitting composition comprising 73 to 88 weight percent petroleum wax, 1 to 5 weight percent ethylene vinyl acetate copolymer having an average molecular weight below 10,000, 2 to 7 weight percent butyl rubber and 9 to 15 weight percent fragrance.

4,405,510

1-ETHOXY-1-ETHANOL ACETATE-ACETALDEHYDE MIXTURES AND USES THEREOF FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

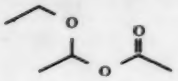
Division of Ser. No. 287,935, Jul. 29, 1981, Pat. No. 4,348,146, which is a continuation-in-part of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137. This application Mar. 26, 1982, Ser. No. 362,239

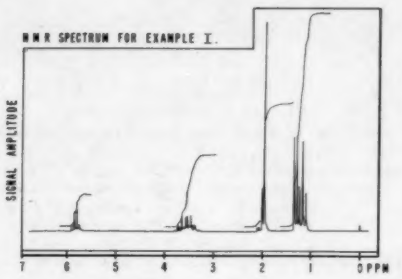
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C11B *9/00*

U.S. Cl. 252—522 R **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfumed composition or a cologne comprising the step of adding to a perfume base or a cologne base an aroma augmenting or enhancing quantity of a mixture of 1-ethoxy-1-ethanol acetate having the structure:





and acetaldehyde, the range of weight ratios of 1-ethoxy-1-ethanol acetate: acetaldehyde being from 50:50 down to 5:95.

4,405,511

CLEANING INTENSIFIER FOR USE IN DRY-CLEANING MACHINES EQUIPPED WITH ADSORPTION FILTERS

Kaspar D. Hasenclever, Taunusstein, Fed. Rep. of Germany, assignor to Chemische Fabrik Kreussler & Co. GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,636

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111129

Int. Cl.³ C11D *1/40, 1/44, 3/43*; D06L *1/04*

U.S. Cl. 252—547 **4 Claims**

1. A cleaning intensifier for use in drycleaning machines equipped adsorption filters comprising in addition to a nonionic surfactant, an alcohol and water, a quaternary ammonium salt in the form of difatty alkyl dimethyl ammonium chloride containing from 12 to 18 carbon atoms in the alkyl radical or a mixture of the homologues, and the triammonium salt of a tricarboxylic acid and a tertiary amine in the form of a fatty alkyl dimethylamine containing from 8 to 18 carbon atoms in the alkyl radical or a hydroxy ethyl amine derivative corresponding to the formula

$$HO-C_2H_4-O-\underset{\displaystyle R}{\underset{|}{CH}}-CH_2-N(C_2H_4-OH)_2$$

where R is a fatty alkyl radical containing from 10 to 18 carbon atoms, or a mixture of these triammonium salts wherein said recited components are present in amounts and proportions effective so as not to be adsorbed to any significant extent by the adsorption filters, to reduce discoloration of textiles and to ensure that cleaned textiles do not build up any substantial electrostatic charge.

4,405,512

PROCESS FOR ENCAPSULATING RADIOACTIVE ORGANIC LIQUIDS IN A RESIN

Harold E. Filter, and Stevens S. Drake, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 32,992, Apr. 25, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,474

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **8 Claims**

1. A process for encapsulating low level radioactive liquid organic waste in a cured resin into a form suitable for burial

wherein said resin is an unsaturated polyester, a vinyl ester resin or a mixture thereof and wherein said waste is a solvent for or is soluble in the uncured resin and is more soluble in water than in the resin, said process comprising the dilution of said waste with water to an extent that the amount of waste that will partition in said uncured resin is less than the amount to retard the cure rate or to adversely affect physical properties of the cured product, followed by the uniform dispersion of the aqueous solution in said curable resin system after which said resin is cured to a solid with said waste dispersed therein.

4,405,513

NOVEL CATIONIC-SUBSTITUTED 9,10-BIS-(PHENYLETHYNYL)ANTHRACENES

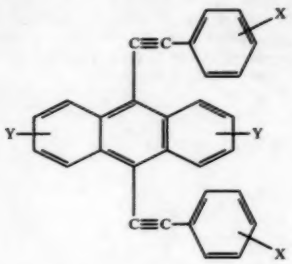
Victor M. Kamhi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 16, 1982, Ser. No. 388,853

Int. Cl.³ C09K *11/06*

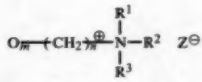
U.S. Cl. 252—700 **11 Claims**

1. A compound defined by the formula



(I)

wherein at least one of the X and Y substituents is a radical defined by the formula:



wherein

m is zero or one,

n is an integer from 1 to 5,

R^1 is C to C_8 alkyl,

R^2 and R^3 are each C_1 to C_8 alkyl or together with the N-atom form a piperidinium, morpholinium or pyrrolidinium ring,

$Z^{\ominus}$ is an anion, and

wherein any remaining X and Y substituents are hydrogen.

4,405,514

PREPARATION OF ESTERS OF RESIN ACIDS, RESINS, ROSINS, AND DERIVATIVES THEREOF

Duane F. Zinkel, Madison, Wis., and Kunio Arimoto, Takasago, Japan, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,396

Int. Cl.³ C09F *1/00, 7/00, 9/00*

U.S. Cl. 260—102 **16 Claims**

1. A process for preparing esters of sterically hindered carboxylic acid components of rosins or resin acids comprising the steps of (a) reacting at a temperature of between about 20° C. to 90° C. for about 2 to 6 hours a quaternary amine salt of said carboxylic acid components with an alkyl or alkenyl halide wherein the amine salt is derived from a quaternary ammonium hydroxide represented by the formula $N(R)_4OH$ wherein R is alkyl or aryl and each R can be the same or different and wherein the alkyl or alkenyl halide is represented by the formula $R_1(X)_n$ wherein R_1 is lower alkyl of from 1 to 6 carbon atoms or lower alkenyl of from 2 to 6 carbon atoms; X is chlorine, bromine or iodine and n is 2 or 3, with the proviso that $R_1(X)_n$ is not chloroform, carbon tetrachloride or 1,2-dichloroethylene, and (b) recovering the resulting esterified product.

4,405,515

HETEROFULVALENE GEMINAL DITHIOLATE COMPOUNDS AND THEIR SELENIUM AND TELLURIUM ANALOGS AND A METHOD OF FABRICATING THE SAME

Edward M. Engler, Wappingers Falls; Vishnubhai V. Patel, Yorktown Heights, both of N.Y., and Robert R. Schumaker, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

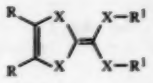
Division of Ser. No. 38,050, May 10, 1979, Pat. No. 4,312,991. This application Aug. 17, 1981, Ser. No. 293,569

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ C07D *409/04*

U.S. Cl. 260—239 R **2 Claims**

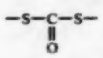
2. A composition of matter having the general structure formula



wherein,

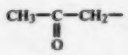
X is selected from the group consisting of S, Se and Te

R is selected from the group consisting of H, lower alkyl, phenyl, cyclopentyl, cyclohexyl and benzo and furan, thiophene and dihydrothiophene groups, cyano and where said R groups are fused in a cyclic or heterocyclic ring or a dithiocarbonate



group and where

R^1 is selected from the group consisting of



lower alkyl, lower alkenyl, lower alkynyl, phenyl, acyl from a carboxylic acid group, cyclopentyl, cyclohexyl and benzo and furan, thiophene and dihydrothiophene and where said R^1 groups are fused in a cyclic or heterocyclic ring.

4,405,516

BENZODIAZEPINE DERIVATIVES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

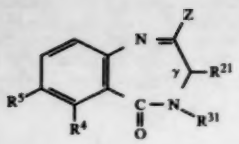
Division of Ser. No. 345,852, Feb. 4, 1982, Pat. No. 4,352,815. This application Jul. 30, 1982, Ser. No. 403,843

Claims priority, application Switzerland, Feb. 27, 1981, 1338/81

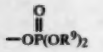
Int. Cl.³ C07D *434/14*

U.S. Cl. 260—239.3 B **5 Claims**

1. A compound of the formula



wherein either R^{21} is hydrogen and R^{31} is lower alkyl or R^{21} and R^{31} together are dimethylene, trimethylene or propenylene and the carbon atom denoted as γ has the (S)- or (R,S)-configuration, one of R^4 and R^5 is hydrogen and the other is nitro or cyano and Z is selected from the group consisting of a halogen atom, an alkylthio group, an aralkylthio group, an N-nitrosoalkylamino group, an alkoxy group, a mercapto group, the group



wherein R^9 is lower alkyl and the group

wherein R and R′ are lower alkyl, alkyl, phenyl or substituted phenyl or R and R′ together with the nitrogen atoms are morpholino.

4,405,517

AZETO-DIAZEPINES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

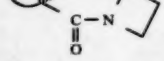
Division of Ser. No. 349,405, Feb. 16, 1982, Pat. No. 4,352,816. This application Jul. 30, 1982, Ser. No. 403,845

Claims priority, application Switzerland, Feb. 27, 1981, 1339/81

Int. Cl.³ C07D *513/14, 513/04*

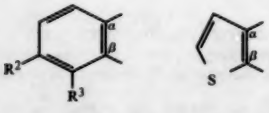
U.S. Cl. 260—239.3 T **3 Claims**

1. A compound of the formula



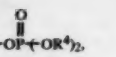
II

wherein A together with the two carbon atoms denoted as α and β is the group

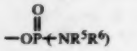


(a) or (b);

wherein R^2 is hydrogen, trifluoromethyl or halogen; R^3 is hydrogen, trifluoromethyl, halogen or lower alkyl and Z is selected from the group consisting of halogen, alkylthio, aralkylthio, N-nitrosoalkylamino, alkoxy, mercapto,



wherein R^4 represents lower alkyl or



wherein R^5 and R^6 each represent lower alkyl, or phenyl or R^5 and R^6 together with the nitrogen atom to which they are attached represent morpholino.

4,405,518

PYRROLO[3,4-d] [2] BENZAZEPINES

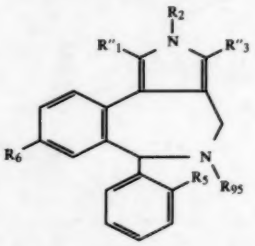
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 286,124, Jul. 23, 1981, Pat. No. 4,354,973, which is a continuation-in-part of Ser. No. 175,555, Aug. 5, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,936

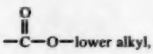
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.7 **1 Claim**

1. The compound of the formula



wherein R_1'' and R_3'' are selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 alkenyl and C_3 to C_7 alkynyl; R_{95} is lower alkyl; R_5 is hydrogen or halogen; R_6 is halogen and R_2 is selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 alkenyl, or C_3 to C_7 alkynyl, the group



hydroxy C_2 to C_7 alkyl and amino or mono- or di-lower alkyl amino C_2 to C_7 alkyl, the group C_1 to C_6 lower alkyl-COR_{21} where R_{21} is hydroxy, lower alkoxy, amino or amino which is mono- or di-substituted by lower alkyl.

4,405,519

DI-ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES

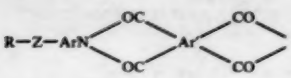
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

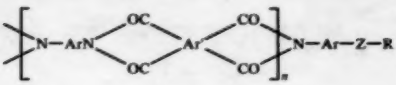
Continuation-in-part of Ser. No. 199,604, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,861

Int. Cl.³ C07D *209/34, 471/00*; C08F *22/40*

U.S. Cl. 548—423 **26 Claims**

1. A polyimide of the formula:





wherein:

Ar′ is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms of said aromatic radical and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar′ except that in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical;

n is an integer having a value of one to 20;

R is hydrogen or an organic moiety containing one to 21 carbon atoms; and

Z is the structure —C≡C—C≡C—.

4,405,520

ADDITION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYMIDE DERIVATIVES AND DIENOPHILES HAVING TERMINAL MALEIMIDE GROPS

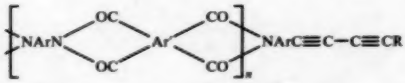
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,609, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,864

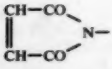
Int. Cl.³ C07D *209/34, 471/00*; **C08F** *22/40*

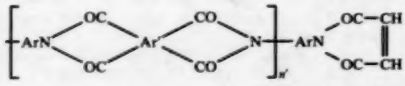
U.S. Cl. 548—423 **18 Claims**

1. The Diels-Alder addition product of a composition of matter comprising a polyimide having the formula:



with a dienophile having the formula





wherein:

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to the adjacent carbon atoms in Ar′ except in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic organic radical;

n is zero or an integer having a value of one to 20;

n′ is zero or an integer having a value of one to 20; and

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms.

4,405,521

ADDITION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES WITH A POLYIMIDE HAVING TERMINAL ETHYLENIC GROUPS

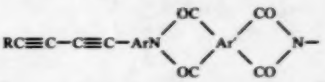
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

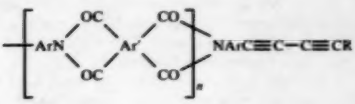
Continuation-in-part of Ser. No. 199,613, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,868

Int. Cl.³ C07D *209/34, 471/00*; **C08F** *22/40*

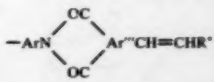
U.S. Cl. 548—423 **22 Claims**

1. The Diels-Alder addition product of a composition of matter comprising a polyimide of the formula:





and a dienophile of the formula:



wherein:

Ar′ is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to the adjacent carbon atoms in Ar′ except in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical;

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms;

n is zero or an integer having a value of one to 20;

R° has the same definition as given for R;

n′ has the same definition as given for n; and

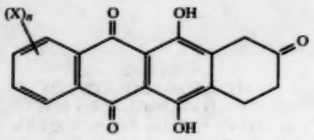
Ar′′′ is a trivalent aromatic radical containing 6 to 12 carbon atoms, to which the attached pair of carbonyl groups is attached to adjacent or peri carbon atoms in said Ar′′′ radical.

4,405,522
ANTHRACYCLINE SYNTHESIS

Lester A. Mitscher, Lawrence, Kans., assignor to Adria Laboratories Inc., Columbus, Ohio

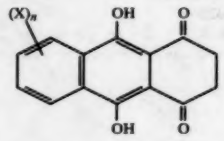
Filed Jan. 18, 1982, Ser. No. 340,434
Int. Cl.³ C07C 50/34, 50/16
U.S. Cl. 260—365 4 Claims

1. A process for producing a 5,12-dihydroxy-1,3,4-trihydro-2,6,11-tetracenetrione compound having the formula:



where X is selected from —OH, —CH_3, —OCH_3, and Cl and n is an integer from 0–2 and when n is 2 the X's are symmetrically substituted on the ring; said process comprising:

(a) reacting a C_1–C_3 alkyl acrylate with a leucoquinizarin having the formula:



where X and n are as defined above, to produce 1,4-dihydroxy-2-(1-ethylcarboxy alkyl)-9,10-anthraquinone;

(b) reducing the compound of (a) by catalytic hydrogenation to produce 2,3-dihydro-5,10-dihydroxy-2-(1-ethylcarboxy alkyl)-anthracene-1,4-dione;

(c) reacting the compound of (b) with a C_1–C_3 alkyl glyoxylate to produce 1,4-dihydroxy-3-(1-methylcarboxy alkyl)-2-(1-ethylcarboxy alkyl)-9,10-anthraquinone;

(d) cyclization of the compound of (c) to produce 3,4-dihydro-5,12-dihydroxy-1-(alkyl-carboxy)-2,6,11-tetracenetrione; and

(e) decarboxylation of the compound of (d) to produce the 5,12-dihydroxy-1,3,4-trihydro-2,6,11-tetracenetrione compound whose formula is shown above.

4,405,523
PROCESS FOR PREPARATION OF BENZOPHENONE, ANTHRAQUINONE AND O-DIBENZOYLBENZENE

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 24, 1982, Ser. No. 361,398
Int. Cl.³ C07C 50/18, 69/76, 49/657
U.S. Cl. 260—369 12 Claims

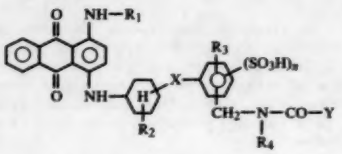
1. A process for the synthesis of at least one compound of the group comprising benzophenone, anthraquinone, and o-dibenzoylbenzene compounds which comprises pyrolysis of a metal salt of a benzoic acid compound, said metal of said salt being selected from the group consisting essentially of yttrium, erbium, and dysprosium and mixtures thereof in an inert atmosphere at a temperature within the range of from about 200° C. to about 600° C. and a pressure of from about 0.1 to about 100 atmospheres.

4,405,524
ANTHRAQUINONE DYES AND METHOD OF USE

Roland Wald, Huningue, France, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 23, 1979, Ser. No. 22,979
Claims priority, application Switzerland, Apr. 7, 1978, 3774/78
Int. Cl.³ C07C 103/76, 143/665; C09B 1/28, 1/36
U.S. Cl. 260—372 20 Claims

1. A compound of formula I,



I

in which

R_1 is alkyl or cycloalkyl,

R_2 is hydrogen, methyl or ethyl,

R_3 is hydrogen or methyl,

R_4 is hydrogen, methyl or ethyl, and Y—CO— is the radical of an organic aliphatic aromatic or araliphatic carboxylic acid containing a total of 2 to 12 carbon atoms,

X is a direct bond or (C_{1-3})alkylene,

n is 0 or 1

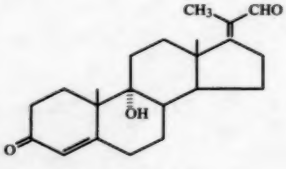
which compound, where n is 1, is in free acid or salt form.

4,405,525
COMPOSITION OF MATTER AND PROCESS

John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 286,308, Jul. 24, 1981. This application Aug. 31, 1982, Ser. No. 413,578
Int. Cl.³ C07J 13/00
U.S. Cl. 260—397.1 1 Claim

1. A compound of the formula



I

4,405,526
PROCESS FOR PRODUCING DIRECTLY ESTERIFIED FATTY ACYL ISETHIONATE BY A MIXED ZINC OXIDE-SULFONIC ACID CATALYST

Vincent Lamberti, Upper Saddle River, and Laurence K. Boen, Park Ridge, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,943
Int. Cl.³ C07C 143/90; C11D 1/28
U.S. Cl. 260—400 5 Claims

1. A method of producing directly esterified fatty acyl isethionate consisting essentially of reacting a fatty acid with an alkali metal isethionate in the presence of a catalyst comprising a mixture of ZnO and an organic sulfonic acid wherein the molar ratio of ZnO to organic sulfonic acid is about 1:1.7 to about 1:0.5 and heating at about 200° C. to about 255° C. for sufficient time to produce the desired directly esterified fatty acyl isethionate.

4,405,527
PROCESS FOR THE PREPARATION OF POLYISOCYANATES

Gerhard Wegener, Wuppertal; Hartmut Knölfel, Odenthal; Günther Ellendt, and Marcel Petinaux, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,652

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129270

Int. Cl.³ C07C *118/02*

U.S. Cl. 260—453 PH 7 Claims

1. A process for the production of a polyisocyanate comprising:

(a) reacting a polyamine solution with a solution of phosgene;

(b) removing excess phosgene and any hydrogen chloride formed during the reaction of (a);

(c) removing the solvent and volatile isocyanate group-containing compounds from the reaction mixture of (b) by distillation;

(d) condensing the solvent and volatile compounds removed in (c);

(e) treating all or a portion of the condensate of (d) with a compound containing isocyanate reactive hydrogen atoms; and optionally,

(f) removing nonvolatile reaction products formed during the treatment (e); and

(g) recycling the treatment condensate of (e) or (f) to the reaction mixture.

4,405,528
METHOD OF PREPARING 4-(α-ALKYL-α-CYANO-METHYL)2,6-DI-SUBSTITUTED PHENOLS

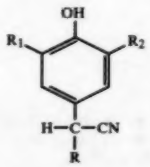
Charles Everly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 7, 1982, Ser. No. 385,610

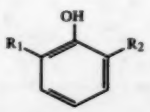
Int. Cl.³ C07C *121/75, 59/11*

U.S. Cl. 260—465 F 31 Claims

1. A process for the preparation of 4-(α-alkyl-α-cyano-methyl)2,6-di-substituted phenol having the formula

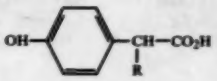


wherein R is methyl, ethyl, n-propyl, or isopropyl and R_1 and R_2 are the same or different monovalent substituent selected from the group consisting of alkyl, aralkyl and cyclic alkyl radicals which comprises reacting a (i) di-substituted phenol having the formula

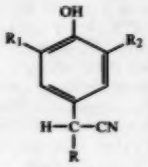


wherein R_1 and R_2 are as defined above with a Friedel-Crafts addition agent in the presence of a Friedel-Crafts catalyst to form the corresponding 4-(α-alkyl-α-oxo-methyl)2,6-di-substituted phenol, (ii) reducing said 4-(α-alkyl-α-oxo-methyl)2,6-di-substituted phenol thus produced to form the corresponding 4-(α-alkyl-α-hydroxy-methyl)2,6-di-substituted phenol and thereafter (iii) reacting said 4-(α-alkyl-α-hydroxy-methyl)2,6-di-substituted phenol with an alkali metal or an alkali earth metal cyanide in a suitable reaction solvent to form the corresponding 4-(α-alkyl-α-cyano-methyl)2,6-di-substituted phenol.

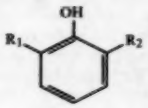
13. A process for preparing α-alkyl-4-hydroxyphenylacetic acid having the formula



wherein R is methyl, ethyl, n-propyl or isopropyl which comprises (i) preparing a 4-(α-alkyl-α-cyano-methyl)2,6-di-substituted phenol having the formula



wherein R is as defined above and R_1 and R_2 are the same or different monovalent substituent selected from the group consisting of alkyl, aralkyl and cyclic alkyl radicals by reacting a di-substituted phenol having the formula



wherein R_1 and R_2 are as defined above with a Friedel-Crafts addition agent in the presence of a Friedel-Crafts catalyst to form the corresponding 4-(α-alkyl-α-oxo-methyl)2,6-di-substituted phenol, (ii) reducing the 4-(α-alkyl-α-oxo-methyl)2,6-di-substituted phenol thus produced to form the corresponding 4-(α-alkyl-α-hydroxy-methyl)2,6-di-substituted phenol, (iii) reacting said 4-(α-alkyl-α-hydroxy-methyl)2,6-di-substituted phenol with an alkali metal or an alkaline earth metal cyanide in a suitable solvent to form the corresponding 4-(α-alkyl-α-cyano-methyl)2,6-di-substituted phenol, (iv) dealkylating the substituent groups ortho to the hydroxyl group from said 4-(α-alkyl-α-cyano-methyl)2,6-di-substituted phenol to form the corresponding 4-(α-alkyl-α-cyano-methyl)phenol and (v) converting said 4-(α-alkyl-α-cyano-methyl)phenol by hydrolysis to the corresponding α-alkyl-4-hydroxyphenylacetic acid.

4,405,529
METHOD FOR THE PREPARATION OF DIFLUOROMETHOXYAROMATIC COMPOUNDS

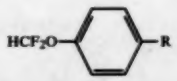
Jack K. Siddens, Princeton Junction, N.J., and Sivaraman Raghu, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,170

Int. Cl.³ C07C *121/75, 43/225, 69/712, 79/35*

U.S. Cl. 260—465 F 9 Claims

1. A method for the preparation of a compound of the structural formula:

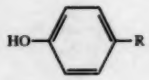


(I)

wherein R is C_1–C_3 alkyl, halogen, nitro, or R is the moiety

wherein R_1 is CN, $COOR_2$, OH, or OR_3, R_2 is C_1–C_3 alkyl, and R_3 is tosyl, mesyl, or C_2–C_4 alkanoyl, comprising: reacting one molar equivalent of a compound of structural formula

(II)



wherein R is as hereinabove defined, at a temperature ranging from approximately 20° to 40° C., in a solvent mixture, of 2-propanol:acetonitrile or 2-propanol:acetone wherein said solvent mixture contains the above solvents in 1:1 to 1:3 volume ratios and said solvent mixture is used in amounts of from 4 to 6 ml per gram of the compound of formula—(II) and in the initial presence of from approximately 870 to 1740 mol percent of water, with two to three molar equivalents of chlorodifluoromethane added under a pressure of from 0.4 to 2.5 kg cm^{-2} over a period of time ranging from approximately 30 minutes to 3.0 hours and with an aqueous solution of four molar equivalents of an alkali metal hydroxide of sodium or potassium hydroxide, wherein the concentration of said aqueous solution is such that on completion of the base addition the total amount of water added in the reaction mixture is of from approximately 1740 to 2610 mol percent, is added essentially simultaneously with the chlorodifluoromethane addition over a period of time ranging from approximately 1.0 to 5.0 hours, and on completion of the base addition the reaction mixture is further maintained at the above pressure and temperature ranges for a period of time of from 0 to 6 hours, or until said reaction is essentially complete.

4,405,530

PROCESS FOR PREPARING FLUORINATED AMINO-NITRILES

Fritz E. Gerhart, Kehl-Leutesheim, Fed. Rep. of Germany, assignor to Merrell Toraude et Compagnie, Strasbourg, France

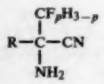
Continuation-in-part of Ser. No. 210,499, Nov. 26, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,505

Claims priority, application United Kingdom, Aug. 20, 1981, 8125475

Int. Cl.[3] **C07C** *120/00, 121/43, 121/45, 121/78*

U.S. Cl. 260—465.5 R **18 Claims**

1. A process for preparing a compound of the formula:

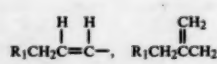


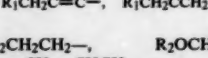
I

wherein:

p is 1 or 2 and

R is:





$R_2OCH_2CH_2CH_2$—,

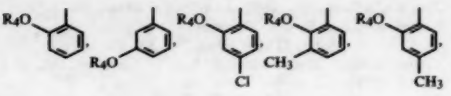
R_3CH_2—, or CH_2=$CHCH_2$—,

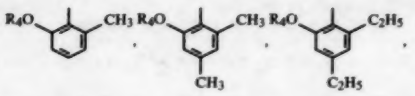
wherein:

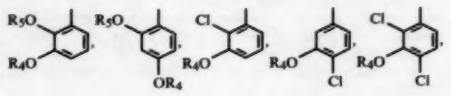
R_1 is hydrogen, methoxy, benzyloxy, diphenylmethoxy, triphenylmethoxy, or allyloxy;

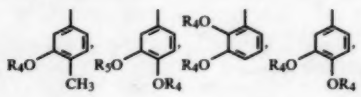
R_2 is methyl, benzyl, diphenylmethyl, triphenylmethyl, or allyl; and

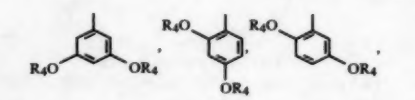
R_3 is a substituted-phenyl group of the formula:

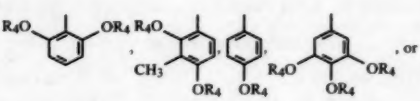


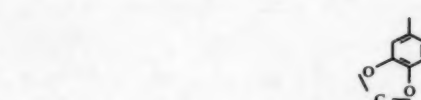




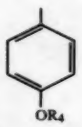






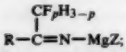


wherein R_4 is (C_1–C_8)alkyl, R_5 is benzyl, and R_6 is hydrogen or methyl; with the proviso that when R is R_3CH_2— wherein R_3 is



p cannot be 2;

which comprises treating a ketimine magnesium halide of the formula:



II

whercin R and p have the meanings hereinabove defined and Z is chloride, bromide, or iodide; with hydrogen cyanide or with an alkali metal cyanide or ammonium cyanide and a proton

source of sufficient acidity to form the corresponding imine from said ketimine magnesium halide.

4,405,531

SALTS OF N-PHOSPHONOMETHYLGLYCINE

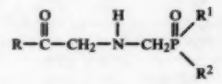
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 630,392, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 362,712, May 22, 1973, abandoned, which is a division of Ser. No. 170,385, Aug. 9, 1971, Pat. No. 3,799,758, which is a continuation-in-part of Ser. No. 123,057, Mar. 10, 1971, abandoned. This application Mar. 8, 1982, Ser. No. 355,931

Int. Cl.³ C07C 9/38

U.S. Cl. 260—501.12 30 Claims

1. A compound of the formula



wherein R, R^1 and R^2 are independently selected from the group consisting of —OH and —OR^6 wherein R^6 is a salt-forming cation selected from the group consisting of alkali metals, alkaline earth metals, copper, zinc, manganese, nickel, ammonium, and organic ammonium, and mixtures thereof provided that when the organic group is aryl the ammonium salt is a primary amine, further provided that no more than two of R, R^1 or R^2 are OR^6 when R^6 is ammonium or organic ammonium and that no more than two of R, R^1 and R^2 are —OH.

4,405,532

METHODS FOR STORAGE OF GUAYULE PLANT MATERIAL

Richard Gutierrez, Canal Fulton; Edward L. Kay, and David J. Serbin, both of Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 1, 1981, Ser. No. 307,405

Int. Cl.³ C08C 4/00, 2/00

U.S. Cl. 260—816 R 3 Claims

1. A method of storing guayule and guayule-like plant material prior to processing which comprises mixing the material in communited form with at least one essentially water-free organic liquid to form a slurry in which the material is protected from contact with oxygen and storing said slurry for at least about 24 hours, wherein said organic liquid is acetone or resin micella comprising acetone and at least about 4% guayule resin.

4,405,533

SUPPLY DEVICE FOR USE WITH EVAPORATIVE CONTACT BODIES

Per Norbäck, Lidingo, and Borje Eriksson, Sigtuna, both of Sweden, assignors to AB Carl Munters, Sollentuna, Sweden

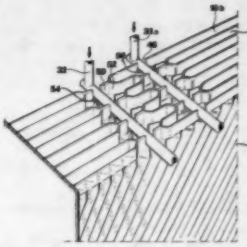
Continuation of Ser. No. 122,838, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 944,246, Sep. 21, 1978, abandoned. This application Jun. 7, 1982, Ser. No. 385,437

Claims priority, application Sweden, Sep. 21, 1978, 7710656

Int. Cl.³ B01F 3/04

U.S. Cl. 261—111 5 Claims

1. A supply device for use in a evaporative contact body of the multi-layer type having gaps between the layers of the body to which water is supplied from above and air is supplied from below, said device comprising water supply pipes and means for forming jets of water and directing said water jets deep into said gaps, said layers of the body having upper edges and laterally spaced recesses formed by said upper edges, said pipes being located in direct contact with said upper edges of the layers of the contact body within said recesses and said water jet directing means being formed on said water supply pipes and located between and inwardly spaced from said layers to direct said water jets directly inside the gaps between said layers in the path of air flow through the contact body whereby the formation of fine drops of water normally formed



by water jets striking the upper edge of the contact body is avoided, said layers of the contact body comprising first and second sets of corrugated sheets disposed alternately with each other to promote rapid distribution of said water laterally within the contact body.

4,405,534

PRODUCTION OF PLASTIC-BONDED EXPLOSIVE SUBSTANCES

Friedrich-Ulf Deisenroth, Fichtenweg 1, 8899 Rettenbach, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,909

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010052

Int. Cl.³ C06B 21/00

U.S. Cl. 264—3 C 12 Claims

1. A process for producing plastic bonded explosives consisting of the steps of providing a crystalline water insoluble explosive, and a fully reacted aqueous polyurethane dispersion substantially free of organic solvent, incorporating said explosive into said dispersion to form a uniform mixture thereof, coagulating said mixture to form granulates thereof, and drying said resultant granulates.

4,405,535

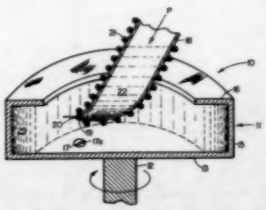
PREPARATION OF RAPIDLY SOLIDIFIED PARTICULATES

Ramaswamy V. Raman, Columbus, and Robert E. Maringer, Worthington, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation of Ser. No. 163,908, Jun. 27, 1980, abandoned. This application Oct. 29, 1981, Ser. No. 316,004

Int. Cl.³ B01J 2/06

U.S. Cl. 264—11 21 Claims



1. A method of preparing solid particulates comprising the steps of

(a) heating a solid material to a molten state adapted to provide a molten unbroken stream of the material which at a temperature within 25 percent of its equilibrium melting point in °K. has a surface tension in the range of 10 to 2500 dynes/cm. and a viscosity in the range of 0.001 to 1 poise; and

(b) flowing the molten unbroken stream into contact with a moving wall of a centrifugally disposed rotating liquid quench fluid in a manner adapted to subdivide the molten stream and to quench into solid particulates within the quench fluid.

4,405,536

PROCESSES FOR SEVERING HOLLOW FIBER MEMBRANES

Maurice L. Woodcock, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 78,871, Sep. 26, 1979, abandoned. This application Dec. 11, 1981, Ser. No. 329,836

Int. Cl.³ B32B *31/00*

U.S. Cl. 264—25 **17 Claims**

1. A process for simultaneously severing and sealing the bores of a plurality of thermoplastic hollow fiber membranes comprising passing a heated member through a bundle consisting of said plurality of hollow fiber membranes in a path transverse to the longitudinal orientation of the hollow fiber membranes, said heated member being at a temperature above the melt temperature of the thermoplastic hollow fiber membranes and being passed through said bundle at a rate less than 50 centimeters per minute, said rate being sufficient to effect severing and sealing the bores of the hollow fiber membranes in an essentially fluid-tight manner; and maintaining said bundle adjacent to the path of said heated member in substantially a desired cross-sectional configuration during the passing of the heated member through said bundle; wherein adjacent hollow fiber membranes adhere to one and another in a zone of thermoplastic material at least about 0.2 millimeters thick such that the hollow fiber membranes at the end of the bundle formed by the severing are substantially maintained in the same desired cross-sectional configuration in the absence of external support.

4,405,537

METHOD AND APPARATUS FOR MANUFACTURING THREE-DIMENSIONAL WORK PIECES

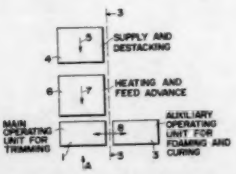
Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 965,745, Dec. 4, 1978, Pat. No. 4,273,738. This application May 4, 1981, Ser. No. 260,418

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ B29C *1/16*

U.S. Cl. 264—45.4 **21 Claims**


SUPPLY AND DESTACKING
HEATING AND FEED ADVANCE
MAIN OPERATING UNIT FOR TRIMMING
AUXILIARY OPERATING UNIT FOR FOAMING AND CURING

1. A method for manufacturing three-dimensional work pieces, comprising the following steps:

a. placing a flat blank of plastics material into or onto a primary mold means compatible for sequential cooperation with a plurality of secondary mold means,

b. shaping said flat blank while it contacts the primary mold means into a molded blank which assumes the form of the primary mold means,

c. bringing the molded blank while it still contacts the primary mold means on one side, into contact with foaming material on the other side of the molded blank for performing a foaming, and closing the primary mold means by a first, secondary mold means for confining and curing of the foaming material whereby the foamed material is bonded to the plastics material of the molded blank to form said three-dimensional work piece,

d. separating the primary mold means and the three-dimensional work piece still held by the primary mold means from the first, secondary mold means,

e. moving the primary mold means with the three-dimensional work piece still being held by the primary mold means into a cooperating position relative to a second, secondary mold means operating as a counterholder, and

f. moving trimming tools relative to a three-dimensional plane defined by at least one of said mold means for trimming the three-dimensional work piece while it is still being held by said primary mold means, whereby the work piece remains on the same primary mold means during all recited manufacturing steps for assuring the dimensional accuracy and stability of the three-dimensional work piece.

4,405,538

RESIN TRANSFER MOLDING SYSTEM WITH CONTROLLED INDUCTION PERIOD FOR EXPANDED SYNTHETIC ARTICLES

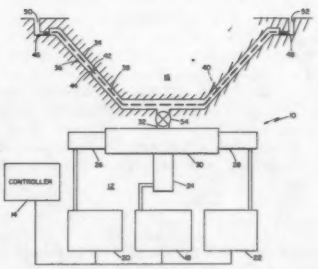
Glen W. Saidla, Stratham, N.H., assignor to Whitney & Company, Inc., Stratham, N.H.

Continuation-in-part of Ser. No. 111,664, Jan. 14, 1980, Pat. No. 4,358,548. This application Aug. 10, 1981, Ser. No. 291,315

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.5 **8 Claims**



1. A method of forming a reinforced synthetic article of polyester resin by transfer of a mixture into a closed mold and allowing it to react therein;

comprising combining a set of reactants to form a mixture which includes

a major mass of polyester resin in fluid form, at least one polyester cure accelerator, a selected quantity of isocyanate, a surfactant and a promoter,

said polyester cure accelerator comprising organic hydroperoxide,

said reactants in said mixture being substantially free of hydrogen peroxide,

said isocyanate being present in sufficient quantity to react to generate carbon dioxide throughout said mixture to cause said mixture to fill said mold and to prevent shrinkage thereof, and

said promoter comprising at least one metallic compound,

placing a reinforcing element within the mold,
closing said mold,
transferring the resultant mixture into said closed mold containing said reinforcing element prior to substantial reaction,
said reactants in said mixture being balanced
to first cause said metallic promoter compound to react exothermically with at least one component of said set to trigger said isocyanate to react with at least said organic hydroperoxide to evolve said carbon dioxide gas to generate pressure to expand said mixture to fill said mold and bring said fluid resin into pressured wetting contact with substantial regions of the surface of the reinforcement to incorporate said element within said resin by self working within the closed mold,
and thereafter, after at least about three minutes following the combining of said reactants, to cause a gellation reaction between said cure accelerator and said polyester to gel and solidify said expanded resin, with said reinforcement element incorporated therein, to produce a reinforced expanded article.

4,405,539

PROCESS FOR THE PRODUCTION OF PATTERNED TILES FROM THERMOPLASTIC SYNTHETIC RESINS

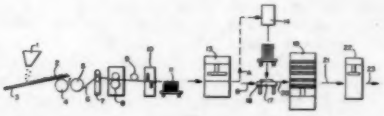
Herbert Schulte; Hans Brinkmann, and Uwe Sommermeyer, all of Troisdorf, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,988

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043245

Int. Cl.³ B29C *9/00*

U.S. Cl. 264—77 **12 Claims**



1. A process for the production of patterned tiles from thermoplastic synthetic resins which comprises forming crude sheet stock from colored thermoplastic synthetic resin; cutting at least two crude sheets of different colors from said sheet stock; punching segments and a segment frame out of said crude sheets without providing clearance between the segment frame and the segments; cooling the segments to a temperature lower than the temperature of the segment frame to cause the segments to shrink; inserting the cooled segments from at least two crude sheets of different colors into a segment frame to provide a panel so that adjacent edges of the segments and the segment frame complement one another; and thereafter press-molding the segments and the segment frame to form an intarsia tile with the use of pressure and heat whereby the segments and the segment frame are welded together along joints formed at the adjacent edges therebetween.

4,405,540

HOT SPRUE VALVE ASSEMBLY FOR AN INJECTION MOLDING MACHINE

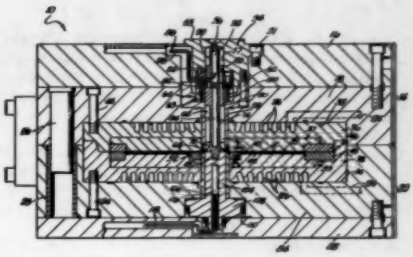
Bruno F. P. Mayer, Orange, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 202,838, Oct. 31, 1980, Pat. No. 4,340,353. This application Aug. 27, 1981, Ser. No. 296,731

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—106 **4 Claims**

1. In an injection molding machine for producing centrally apertured record discs, said machine including a generally disc-shaped mold cavity and a sprue bushing for flow of molten disc-forming material into the mold cavity, a method of controlling flow of the disc-forming material into the mold cavity comprising the steps of:
positioning a poppet valve generally at the end of the sprue bushing adjacent the mold cavity;
biasing the poppet valve to a normal closed position seated upon the adjacent end of the sprue bushing to prevent flow of the molten disc-forming material from the sprue bushing into the mold cavity;
injecting molten disc-forming material into the sprue bushing at a pressure sufficient to force the poppet valve to



move generally across the mold cavity to an open position spaced from the sprue bushing to allow flow of the molten disc-forming material through the sprue bushing into the mold cavity;
returning the poppet valve to its closed position by advancing a ram on the side of the mold cavity opposite the sprue bushing into bearing engagement with the poppet valve;
allowing the disc-forming material in the mold cavity to solidify; and
ejecting the solidified molded disc from the mold cavity.

4,405,541

VIDEO DISC PROCESSING

Maurice D. Coutts, Plainsboro, and Dennis L. Matthies, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,314

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **10 Claims**

1. In the manufacture of a conductive, high density information disc having video and audio information in the form of geometric variations in an information track which can be reconstituted in electrical signal form with a playback stylus, wherein a conductive plastic is molded to form said high density information disc, the improvement which comprises treating the surfaces of said high density information disc with an ammonium salt selected from the group consisting of ammonium chloride, tetramethyl ammonium chloride, tetramethyl ammonium bromide and ammonium bromide to render the playback quality of said high density information disc substantially resistant to and stable under conditions of high relative humidity.

4,405,542

METHOD FOR THE PRODUCTION OF A COMPOSITE MATERIAL

Marian B. Greer, RR #1, Box 74, Coulterville, Ill. 62237

Filed Jan. 25, 1982, Ser. No. 342,609

Int. Cl.³ B29J *5/00*

U.S. Cl. 264—109 **19 Claims**

1. A method for the production of a composite rigid article formed from irregularly shaped particles of comminuted wood and wood-like materials, encompassing a wide range of material sizes, thicknesses and types, comprising:
a. blending an amount of said wood particles and a sufficient

amount of suitable, curable adhesive to form a uniform mixture,

b. forming said mixture into a loosely assembled mat,

c. compressing said mat to a volume not less than about 35% of the original volume of said mat, and

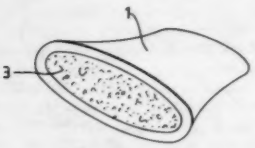
d. curing said adhesive to bond the wood particles into said composite rigid article.

4,405,543

MATERIALS SUITABLE FOR THERMOSETTING

David J. Murphy, Church Crookham, and Leslie N. Phillips, Farnborough, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 139,733, Apr. 11, 1980, abandoned.
This application Sep. 13, 1982, Ser. No. 417,516
Claims priority, application United Kingdom, Apr. 20, 1979, 7913896
Int. Cl.³ B32B 5/16; B27V 5/00
U.S. Cl. 264—123 5 Claims



1. A method of fusing particles to produce a lightweight article comprising the steps of:

(a) coating a collection of hollow particles with a hardenable Friedel-Crafts resin to obtain a moist mass;

(b) breaking up the moist mass obtained according to step (a) into grains, each of said grains comprising one or more of the hollow particles coated with the resin;

(c) drying the grains obtained according to step (b);

(d) filling a cavity defined by the article with the dried grains; and

(e) heating the article and grains filled in the cavity according to step (d) to harden the resin and thus fuse the grains one to another in the cavity to form a stiff core for the article.

4,405,544

STRENGTHENING OF CARBON BLACK-TEFLON-CONTAINING ELECTRODE

Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 202,876, Oct. 31, 1980, Pat. No. 4,337,140.
This application Feb. 16, 1982, Ser. No. 348,824
Int. Cl.³ B29C 6/00; B27J 5/00
U.S. Cl. 264—127 3 Claims

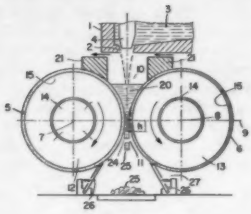
1. A method for preparing an electrode active layer comprising mixing an aqueous dispersion of particulate polytetrafluoroethylene with an aqueous suspension of particulate carbon black; washing and drying; mixing with a pore-forming agent; fibrillating said mixture; drying; adding polytetrafluoroethylene fibers while chopping said dried fibrillated mixture and thereafter forming said chopped mixture into a sheet, which was washed and dried.

4,405,545

METHOD AND APPARATUS FOR RAPIDLY SOLIDIFYING AND COOLING MELTED PRODUCTS BASED ON METAL OXIDES BY CONTINUOUS CASTING

Louis Septier, and Michel Demange, both of Le Fayet, France, assignors to Societe Francaise d'Electrometallurgie Sofrem, Paris, France

Filed Jan. 26, 1982, Ser. No. 342,847
Claims priority, application France, Jan. 30, 1981, 81 02179
Int. Cl.³ B28B 1/54
U.S. Cl. 264—144 25 Claims



1. A method for rapid solidification and cooling of a melted metal oxide-base product by continuous casting comprising the steps of:

(a) feeding the melted product into a convergent space formed between two juxtaposed cylinders of predetermined radius thereby forming a pool of melted product above the nip of the cylinders, said cylinders having axes of rotation parallel and substantially horizontal, the distance between the axes being equal to the sum of the radius of each cylinder plus at least about one millimeter;

(b) cooling the walls of the cylinders;

(c) counter-rotating the cylinders at a substantially equal peripheral speed;

(d) altering the peripheral speed and cooling of the cylinders so that the melted product is not completely solidified until it passes beyond a plane passing through the axes of rotation of the cylinders; and

(e) retrieving solidified product from a divergent space formed between the cylinders on the side opposite the convergent space.

4,405,546

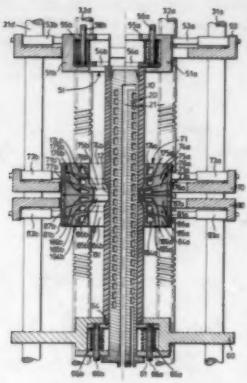
METHOD FOR PRODUCING A TUBULAR OBJECT OF POLYETHYLENE TEREPHTHALATE OR SIMILAR THERMOPLASTIC MATERIAL FROM A TUBULAR BLANK OF AMORPHOUS MATERIAL

Kjell M. Jakobsen, Hökvägen, and Claes T. Nilsson, Pramvägen, both of Sweden, assignors to PLM AB, Malmo, Sweden

Filed May 18, 1981, Ser. No. 264,665
Claims priority, application Sweden, May 29, 1980, 8004003
Int. Cl.³ B29C 17/02, 17/14
U.S. Cl. 264—159 20 Claims

1. A method for producing an object of polyethylene terephthalate or similar thermoplastic material from a tubular blank with a wall of essentially amorphous material, said object being adapted to be reshaped into a container, said method comprising forming the wall of the tubular blank with a region of thinner material and a transitional zone between the thinner material and a remaining thicker portion of said wall, engaging a mechanical shaping device with said transitional zone, applying axial force to said transitional zone by relatively moving said shaping device and blank axially to move said transitional zone axially relative to said blank while simultaneously elongating the blank by increasing the length of the region of thinner material of the blank and reducing the length of said thicker portion of the blank and effecting an orientation of the thus elongated and reduced thickness of the blank in said region of thinner material corresponding to the orientation

which would be obtained by monoaxially stretching to yielding a sheet of amorphous material of the same thickness of said wall of the tubular blank, the temperature of the material at the



commencement of reduction of thickness being not higher than in the vicinity of the glass transition temperature (TG) of the material.

4,405,547

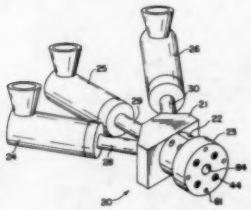
METHOD OF COEXTRUDING DIVERSE MATERIALS

Paul E. Koch, Chagrin Falls; Thomas J. Bond, and Richard C. Adams, both of Chardon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 198,312, Oct. 20, 1980, Pat. No. 4,336,012. This application Apr. 19, 1982, Ser. No. 369,596

Int. Cl.³ B29D *7/02*; B29F *3/04*

U.S. Cl. 264—171 **7 Claims**



1. A method for reducing perturbation while coextruding layered products from at least a first and second material, said materials being dissimilar, comprising the steps of:

moving said first and second materials to a coextrusion device having sequentially a manifold, a feedblock and an adaptor;

directing said first and second materials into separate flow streams in said manifold;

feeding said flow streams into said feedblock from said manifold and maintaining each separate while passing therethrough;

reducing the cross-section area of said first and second flow streams in a portion of said feedblock;

forming at least one separate profile for said first and second flow streams in the remaining portion of said feedblock without further reducing said cross-sectional area thereof;

dividing a portion of said second flow stream into two separate profiles, a major profile having substantially more than half of said second material and a minor profile having substantially less than half of said second material wherein said minor profile is oriented between said profile of said first material and said major profile and each said profile is maintained separate from said other profiles;

combining said profile of said first flow stream, said minor profile and said major profile within said adaptor;

providing a streamlined configuration of said first and second flow streams within said adaptor mating with a conventional extrusion die; and

coextruding the layered product through said die.

4,405,548

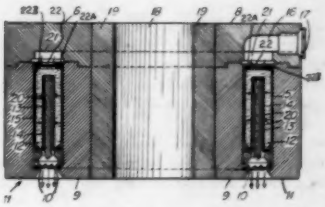
PROCESS FOR FILTERING MOLTEN POLYMER

Arnold J. Cobb, Florence, S.C., assignor to Fiber Industries, Inc., New York, N.Y.

Filed Jul. 9, 1981, Ser. No. 281,739

Int. Cl.³ D01D *1/10*

U.S. Cl. 264—176 F **4 Claims**



1. An improved process for the production of shaped polyester articles such as meltspun yarn, including the step of filtering molten polyester polymer by passing the molten polymer through a filter bed of permeable ceramic material, wherein the improvement comprises:

forcing the molten polyester polymer at pressure drops of up to 12,000 psi through a bed which comprises a plurality of microcrystalline sintered bauxite particles having a roundness of at least 0.8, as determined by Krumbein and Sloss Chart of 1955, and an API standard mesh size of at least 12, and wherein the sintered bauxite particles comprise at least 5.6 percent by weight of Fe_2O_3

whereby the filter bed's life is extended.

4,405,549

ZINC-FREE PREPARATION OF RAYON FIBERS

Albin F. Turbak, Convent Station, and Peter J. Hartmann, Dover, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 13, 1981, Ser. No. 283,070

Int. Cl.³ D01F *2/06*

U.S. Cl. 264—188 **6 Claims**

1. A process for preparing rayon fibers having a wet modulus of more than 0.4 g/den., a wet elongation of less than 15% and a solubility in 6.5% caustic of less than 9% comprising

preparing an unmodified viscose spinning solution from cellulose having a degree of polymerization of less than 600, said solution having a salt index of from 3 to 7,

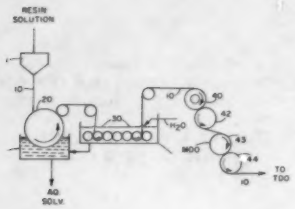
spinning said viscose solution into a zinc-free coagulation bath comprising at least 125 g/l of Na_2SO_4, at least 125 g/l of $(NH_4)_2\ SO_4$ and from about 25 to 100 g/l of H_2SO_4 while said bath is at a temperature from about 40° to 100° C. and

stretching the resulting coagulated filament in a secondary bath while said secondary bath is at a temperature from about 70° to 100° C.

4,405,550
MANUFACTURE OF POLYIMIDE FILM BY SOLVENT CASTING

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 17, 1981, Ser. No. 255,028
Int. Cl.³ B29D 7/02, 7/24
U.S. Cl. 264—216 12 Claims



1. A method for making optically clear oriented polyimide film comprising:

(a) applying onto a film supporting cooled surface a hot concentrated solution of polyimide in a polar aprotic organic solvent to provide a film comprising said polymer and said solvent;

(b) comparatively slowly coagulating the polymer by contacting said film with an aqueous medium containing a major amount of organic solvent and a minor amount of water;

(c) at least substantially replacing the solvent in said film with water;

(d) machine direction orienting said water-containing film; and

(e) transverse direction orienting said water-containing film; and

(f) drying the biaxially oriented film while under constraint to remove at least substantially all water.

4,405,551
PROCESS FOR PROVIDING COLOR CONTRAST ON SURFACE OF MOULDED ARTICLE

John Barnard, Letchworth, and Barry D. Bloombaum, Luton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 10, 1982, Ser. No. 356,745
Claims priority, application United Kingdom, Mar. 20, 1981, 8108775
Int. Cl.³ B29C 5/08, 9/00; B29D 9/00
U.S. Cl. 264—245 5 Claims

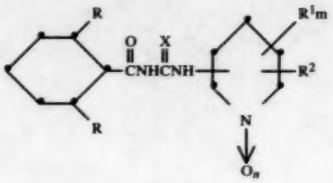
1. A method of moulding a shaped article from a curable composition in which the composition is cured in a mould comprising at least two mould parts defining a cavity characterised in that prior to introducing the curable composition into the mould cavity, at least part of the surface forming the mould cavity is provided with a deposit of a material which provides a colour contrast with the curable composition, the deposit being provided on areas of the mould which correspond to the areas on the cured moulding on which the colour contrast is required to be reproduced, the deposit consisting of at least one finely divided pigment mixed with at least one finely divided filler.

4,405,552
1-BENZOYL-3-(ARYLPHYRIDYL)UREA COMPOUNDS

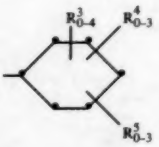
John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 240,331, Mar. 3, 1981, abandoned. This application May 18, 1981, Ser. No. 264,494
Int. Cl.³ A01N 43/40; C07D 213/74
U.S. Cl. 424—263 237 Claims

1. Compound of the formula



wherein each R is independently
H,
Br,
Cl,
F,
CH_3, or
OCH_3
with the proviso that both R groups are not simultaneously H, and with the further proviso that when one R group is fluoro or methoxy the other R group is not simultaneously H;
X=O or S;
n=0–1;
R^1 is independently
Cl,
Br,
CH_3, or
CH_3CH_2;
m=0–2; and
R^2 is a phenyl radical of the formula:



R^3 represents
Br,
Cl, or
F;
R^4 represents
CF_3,
OCF_3,
OC_2F_5,
OCF_2CF_2H, or
SCF_3;
R^5 represents
Methyl,
Ethyl,
Methoxy,
Ethoxy,
SCH_3, or
SCH_2CH_3
with the limitation that the entire substituted phenyl radical bears
(1) not more than 4 substituents, when all substituents are halo substituents;
(2) not more than 3 substituents, when any one substituent is other than halo;

(3) not more than 2 different substituents;

and wherein positions on the pyridine ring are as follows:

(1) the NH to pyridine bond is at the 2-position of the pyridine ring, the R^2 group is at the 5-position of the pyridine ring, and when m=1-2, any R^1 is at the 4-, 6-, or 4 and 6-positions of the pyridine ring, subject to the limitation that

(a) when simultaneously R^1 represents bromo and n=0, m=1 and R^1 is at the 6-position;

(b) when simultaneously R^1 represents Cl and m=1, R^1 is at the 6-position;

(c) when simultaneously m and n=0 and each R represents OCH_3, R^2 is not unsubstituted phenyl, 3-chlorophenyl, 3,4-dichlorophenyl, or 4-methoxyphenyl;

(d) when simultaneously m and n=0 and each R represents CH_3, R^2 is not 4-chlorophenyl;

(e) when simultaneously m and n=0 and one R represents Cl and the other R represents H, R^2 is not 3-chlorophenyl, 3,4-dichlorophenyl, 4-tolyl, 4-methoxyphenyl, or 3,4,5-trimethoxyphenyl;

(f) when simultaneously m=2 and n=0 and one R^1 moiety represents CH_3 or CH_3CH_2, the other R^1 moiety is not chloro or bromo;

(g) when n=1, neither R represents CH_3 or OCH_3, any R^1 represents CH_3 or Cl, and R^2 represents a para-substituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;

(h) when n=1 and one R group simultaneously represents H, m=1-2; or

(2) the NH to pyridine bond is at the 3-position of the pyridine ring, the R^2 group is at the 6-position of the pyridine ring, and when m=1, any R^1 is at the 5-position of the pyridine ring, subject to the limitation that m=0-1 and

(a) when n=0, R^1 represents CH_3 or CH_3CH_2;

(b) when simultaneously n=0 and one R represents Cl and the other R represents H, R^2 is not 3-chlorophenyl;

(c) when simultaneously n=0 and one R represents CH_3 and the other R represents H, R^2 is not unsubstituted phenyl;

(d) when n=1, each R independently represents Cl or F, any R^1 represents CH_3, and R^2 represents a para-substituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;

or an agriculturally acceptable acid addition salt thereof.

80. Method of suppressing insects of an order selected from the group consisting of Coleoptera, Diptera, Lepidoptera, and Orthoptera, which comprises applying to the locus of the insects an insecticidally effective amount of an active agent which is a compound of claim **1**.

159. Composition comprising an excipient and an insecticidally effective amount of an active agent which is a compound of claim **1**.

4,405,553
METHOD OF MANUFACTURING A COIL FOR AN ELECTRICAL MACHINE

Göran Lövgren, and Bengt Rothman, both of Skultuna, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Mar. 1, 1982, Ser. No. 353,389
Claims priority, application Sweden, Mar. 4, 1981, 8101400
Int. Cl.³ B29B *3/00*
U.S. Cl. 264—272.19 **6 Claims**

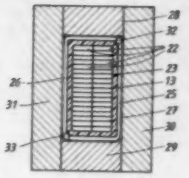
1. A method of manufacturing a coil having a slot portion intended to be arranged in a slot in a stator or rotor of an electrical machine, comprising:

forming a coil part comprising a bundle of electrically insulated conductor lengths arranged close together and insulation surrounding the bundle;

arranging a portion of the coil part destined to form the slot portion in a compressible mould having at least two mould parts;

surrounding the mould with a heat-shrinkable material, which is penetrable by an impregnating resin, to form a mould assembly;

pressing and heating the mould assembly so that said coil part portion is pressed by the mould parts into a desired final shape with the mould parts being spaced from each other so as to provide longitudinal gaps between confronting longitudinal edges thereof and so that the heat-shrinkable material is caused to shrink, the shrunk material



maintaining the coil part portion in its desired final shape after removal of the application of the heat and pressure to the mould assembly;

impregnating said insulation of the mould assembly with said impregnating resin;

transforming the impregnating resin into a solid state in said insulation; and

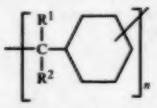
removing the mould parts and heat-shrinkable material to provide said coil with said slot portion.

4,405,554
USE OF HYDROGENATED POLYBENZYLS AS A MOULD-RELEASE AGENT FOR AROMATIC POLYESTERS

Dieter Freitag, Krefeld; Klaus Reinking, Wermelskirchen, and Peter Tacke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,057
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035147
Int. Cl.³ B29B *5/04*
U.S. Cl. 264—300 **10 Claims**

1. In the process of moulding an aromatic polyester in the presence of a mould-release agent, the improvement wherein said mould-release agent is hydrogenated polybenzyl of the formula



wherein n is 3 to 300 and R^1 and R^2 are each hydrogen or alkyl having from 1 to 5 carbon atoms.

4,405,555
PROCESS AND DEVICE FOR VULCANIZING POWER TRANSMISSION BELTS

Paolo Egidi, Monza, and Fulvio Franchino, Milan, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Jun. 30, 1981, Ser. No. 279,011
Claims priority, application Italy, Jul. 18, 1980, 23522 A/80
Int. Cl.³ B29H *5/18, 5/00;* **B29D** *29/00, 7/22*
U.S. Cl. 264—315 **11 Claims**

1. A process for vulcanizing vulcanizable endless belts comprising the steps of:

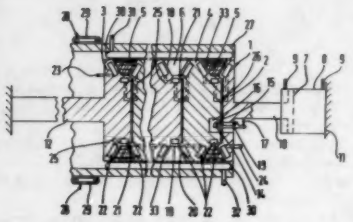
(a) disposing coaxially to each other a jacket about a drum in radially spaced relationship, said drum having at least one

circumferential groove in its surface for insertion of an endless belt to be vulcanized, and the resulting assembly having a diaphragm disposed in the space between the jacket and drum;

(b) inserting the belt in said groove;

(c) applying pressure on the outermost surface of the belt to be vulcanized by inflating the diaphragm to smooth the belt in the groove and simultaneously heating uniformly and immediately the belt to be vulcanized along at least three of its sides by exposing said sides to the walls of said groove which are directly heated at the same time by heating means disposed in correspondence of the walls of said groove;

(d) collapsing the diaphragm and moving the jacket away from the drum;



(e) cooling differentially the belt to complete the vulcanization; and

(f) removing the vulcanized belt from the drum.

6. An apparatus for vulcanizing vulcanizable power transmission belts comprising a drum provided with at least two plates having their outer surface faceted to define at least one circumferential groove when said plates are in contact with each other, a jacket coaxial with the drum, a flexible and inflatable diaphragm associated with the inner surface of the jacket, means for smoothing said belt to be vulcanized on the surface of said diaphragm in contact with said drum, means for conveying a fluid under pressure into said diaphragm, heating means disposed in correspondence of said facetings inside said plates, means for cooling differentially the belt to complete the vulcanization.

4,405,556

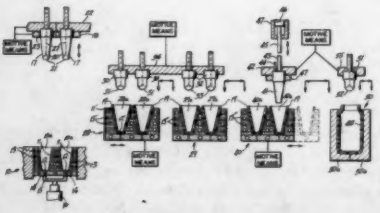
PROCESS AND APPARATUS FOR FORMING ORIENTED, BLOWN ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Filed Jan. 27, 1982, Ser. No. 343,172

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—513 **15 Claims**



1. A method for the preparation of oriented hollow articles of moldable organic plastic material in a rapid operating cycle by injection molding a plurality of parisons in a plurality of injection molds, tempering said parisons in at least one tempering mold to obtain uniform orientation conditions and orienting and expanding the tempered parisons to obtain the hollow articles, the improvement which comprises: providing a first group of tempering molds containing a number of mold cavities equal to the number of injection mold cavities, wherein said first group is in spaced relationship to said injection molds; transferring said parisons from said injection molds to said first group for tempering; tempering said parisons in said first group; providing a tempered parison storage facility for maintaining parisons in the fully tempered condition in spaced relationship to said first group and containing means to accommodate parisons equal to the number of cavities in said first group; transferring fully tempered parisons to said facility; maintaining said parisons in the fully tempered condition in said facility; providing a number of blow molds for final expansion in spaced relationship to said facility in an amount less than may be accommodated in said facility; transferring a first number of tempered parisons equivalent to the number of blow molds from said facility to said blow molds for orientation and expansion and orienting and expanding said first number; and transferring at least one second number of tempered parisons equivalent to the number of blow molds from said facility for orientation and expansion and orienting and expanding said second number.

9. An apparatus for the preparation of oriented hollow articles of moldable organic plastic material in a rapid operating cycle including a plurality of injection molds for forming a plurality of parisons, a plurality of tempering molds for tempering the parisons to obtain uniform orientation conditions, and a plurality of blow molds for expanding the parisons to obtain the hollow articles, the improvement which comprises: a first group of tempering molds in spaced relationship to the injection molds, wherein said group contains a number of mold cavities equal to the number of injection mold cavities; means engageable with the parisons for transferring the parisons from the injection molds to said first group for tempering; a tempered parison storage facility for maintaining parisons in the fully tempered condition in spaced relationship to said first group and containing means to accommodate parisons equal to the number of cavities in said first group; means associated with said facility for maintaining parisons in the fully tempered condition therein; means engageable with said parisons for transferring fully tempered parisons to the facility; a number of blow molds for final expansion in spaced relationship to the facility in an amount less than may be accommodated in the facility; means engageable with a first number of tempered parisons in the facility equivalent to the number of blow molds for transferring same to the number of blow molds for orientation and expansion; and means engageable with at least one second number of tempered parisons in the facility equivalent to the number of blow molds for transferring same to the number of blow molds for orientation and expansion.

4,405,557

PROCESS FOR MANUFACTURE OF HOLLOW BODIES FROM SYNTHETIC MATERIALS

Jakob Lehnard, Horhausen, Fed. Rep. of Germany, assignor to Kautex Werke Reinold hagen AG, Bonn-Holzlar, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,071

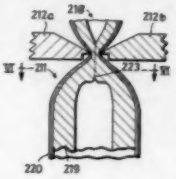
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009463

Int. Cl.³ B29C *17/07*; B29D *9/04*

U.S. Cl. 264—515 **14 Claims**

1. A process for manufacturing a hollow body for containing a substance, said body comprising at least principally synthetic plastic materials, at least portions of the walls of said body comprising at least three layers of different plastic materials including a synthetic thermoplastic carrier layer, a bonding layer on at least one side of said carrier layer, and at least one barrier layer bonded to said carrier layer by said bonding layer, said barrier layer comprising a material with characteristics differing from those of said carrier layer the extent that a mixture of said material with those materials of said carrier layer and said bonding layer cannot be re-used or can be re-

used only to a very limited extent, said process including initially forming a premolded form and subsequently shaping said form into at least a portion of a finished product by means of pressure differential, characterized by simultaneously producing said form by co-extrusion with at least a carrier layer and a bonding layer but without a barrier layer, said carrier layer



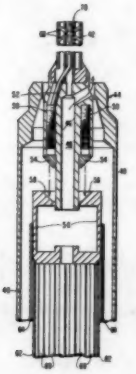
and bonding layer comprising materials which are chemically related so as to allow recycle and re-use of waste portions, shaping said form by blow molding into a finished or intermediate product with accompanying formation of waste portions for recycle and re-use, and subsequently applying at least one said barrier layer to at least a section of said product in a separate operation after said shaping.

4,405,558

NUCLEAR REACTOR SHUTDOWN SYSTEM

James D. Mangus, Hempfield Township, Westmoreland County, and Martin H. Cooper, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1980, Ser. No. 197,380
Int. Cl.³ G21C *7/08*
U.S. Cl. 376—233 **1 Claim**



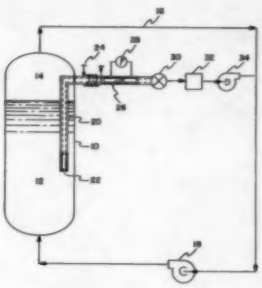
1. Nuclear reactor shutdown apparatus comprising:
neutron absorbing control rods arranged to be inserted in a control assembly of a nuclear reactor core having a coolant flowing therethrough;
a magnetic latch comprising an upper member having a bore therethrough for flow of reactor coolant, a lower member, and a coil;
said lower member slidably disposed on the lower end of said upper member and attached to said control rods for suspending said control rods above said reactor core;
said coil disposed around said upper member and connected in an electrical circuit for establishing a magnetic flux through said upper member and said lower member for magnetically suspending said lower member above said reactor core when said coil is energized;
a tubular member connected to said bore in said upper member and disposed in the flow of reactor coolant;
a plurality of conduits located remote from said coil and connected to said tubular member for conducting a portion of said reactor coolant exiting said reactor core through said tubular member; and
a temperature responsive resistor disposed in said tubular member near said conduits in the flow of said reactor coolant and located downstream of and remote from said coil and connected to said coil by said electrical circuit whereby an increase in said reactor coolant temperature raises the temperature and resistivity of said temperature responsive resistor thereby reducing the electrical current flowing through said coil and reducing the magnetic flux through said upper member and said lower member which causes said lower member to slide downwardly relative to said upper member thereby inserting said control rods into said control assembly.

4,405,559

COOLANT MONITORING APPARATUS FOR NUCLEAR REACTORS

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 6, 1981, Ser. No. 290,289
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—247 **6 Claims**



1. An apparatus for monitoring coolant within a nuclear reactor vessel having a pressurized circulating liquid coolant loop, said apparatus comprising:
tubing means having an open end with a first restriction means positioned within the vessel, said tubing means leading through the vessel for delivering pressurized coolant from its open end to the vessel exterior;
second restriction means operably interposed between the open end of the tubing means and said pump means for causing a pressure drop in coolant drawn along the length of the tubing means; and
sensing means connected across said second restriction means for providing an output signal as a function for the pressure drop of the coolant across the second restriction means;
wherein said first and second restriction means are arranged in series along said tubing means.

4,405,560

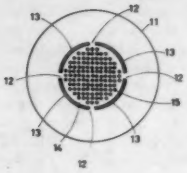
CARRIER FOR HOLDING ANALYTICAL SAMPLES

Michihiro Murata, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,473
Int. Cl.³ B01L *3/00*; G01N *1/28*
U.S. Cl. 422—102 **5 Claims**

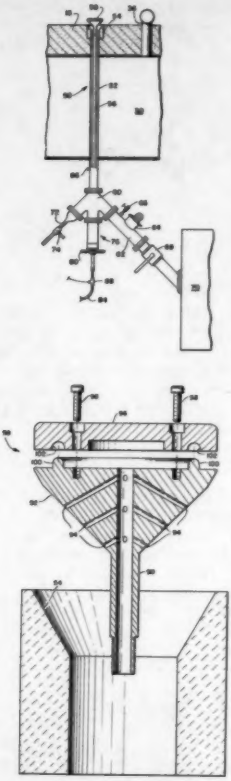
1. A carrier comprising a medium for holding analytical samples to be subjected to X-ray analysis and having a natural

porosity such that solutions of said samples are allowed to permeate into said medium by means of capillary action, comprising an island-like portion to hold said analytical samples contrasted with the surrounding region and defined by a plu-



rality of alternate slits and support portions, each support portion defined between adjacent slits, said island-like portion being formed with a plurality of fine preformed holes, each hole having a diameter of about 1 mm, which comprise 10–70% of the area of the island-like portion.

and the inner wall of said pipe and into said bed to prevent clogging of materials in said pipe, and means for introducing a



pressurized gas into said stem for passage through said stem and through said passages in said valve head to purge said seat.

4,405,561

DRAIN AND SAMPLING VALVE ASSEMBLY FOR A FLUIDIZED BED REACTOR

Thomas J. Neale; Frederick C. Alverson, and John S. Karg, all of Harlingen, Tex., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 29, 1981, Ser. No. 316,375

Int. Cl.[3] **B01J** *8/26, 8/18;* **F27B** *15/08*

U.S. Cl. 422—145 **5 Claims**

1. In a fluidized bed reactor having a material fluidizing means and a bed material discharging means; the improvement wherein said bed material discharging means comprises a pipe extending from a location external of said reactor, to said bed, a valve seat communicating with said bed, a hollow valve stem disposed in said pipe and extending for the length of said pipe, a valve head mounted at one end of said stem and adapted to cooperate with said seat, a plurality of passages registering with the interior of said stem and directed towards said valve seat, means located externally of said reactor and cooperating with the other end portion of said stem for selectively moving said stem relative to said pipe, and said valve head relative to said seat, to control the flow of material from said fluidized bed into said pipe, means for introducing a pressurized gas into said pipe for passage through the passage formed between said stem

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4,405,562

AXIAL-RADIAL REACTOR FOR HETEROGENEOUS SYNTHESIS

Umberto Zardi, Lugano, Switzerland, and Ettore Comandini, Rome, Italy, assignors to Ammonia Casale S.A., Lugano, Switzerland

Filed Nov. 5, 1981, Ser. No. 318,568

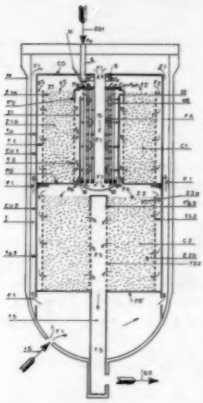
Int. Cl.[3] **B01J** *8/04;* **C01C** *1/04*

U.S. Cl. 422—148 **5 Claims**

1. In a vertical apparatus for heterogenous exothermic catalytic reactions of gases under pressure comprising: a container having an inlet for introduction of gaseous reactants and an outlet for the efflux of products of the reactions; a cartridge having a lid and a cylindrically shaped wall mounted within the container and communicating with the inlet and the outlet; at least two stationary-bed catalyst-containing baskets supported within the cartridge, each of said baskets having an imperforate bottom section, a cylindrical perforated outer wall, a cylindrical lower-perforated concentric inner wall and an annular opening defined by said perforated outer and inner walls in the upper end of each stationary-bed catalyst-containing basket; wherein the opening formed in a plane approximately perpendicular to the longitudinal axis of the perforated outer and inner walls, the bottom section, and the perforated

inner and outer walls, cooperates with the cylindrically shaped cartridge wall to form a partially restrictive axial flow means; whereby a portion of the gaseous reactants enters or departs and passes through the annular opening in each of the stationary-bed catalyst-containing baskets substantially in the axial direction and the remainder of the gaseous reactants enters and passes through the cylindrical outer perforated wall of each of the catalyst-containing baskets substantially in a radial direction;

the improvement wherein a heat exchanger is positioned within an annular central zone defined by the perforated inner wall of at least the uppermost of said baskets; said heat exchanger comprising a central tube whose upper end is adapted to receive cold process gas which has been introduced at the lower end of said container and which has first passed upward between the container and the



cartridge and whose lower end opens to a baffle adapted to direct the process gas exiting said central tube upward through a plurality of heat exchanging tubes parallel to said central tube and mounted between said central tube and said perforated inner wall; the heated gas exiting from the top of said heat exchanging tubes then being directed radially outward to the top of said uppermost catalyst basket through a free zone defined by said cartridge lid, so that pre-heated gas leaving the heat exchanger tubes is directed through the catalyst bed of the uppermost basket and when exiting through the perforated inner wall after being heated by the catalysis the hot gas flows around the heat exchanger tubes giving up heat to the cold gas passing upward through said heat exchanger tubes, before passing to the next lower basket;

and the further improvement wherein means for introducing quenching gas into said free zone are provided.

4,405,563

SCAVENGING NATURAL GAS STREAMS WITH SLURRY APPARATUS

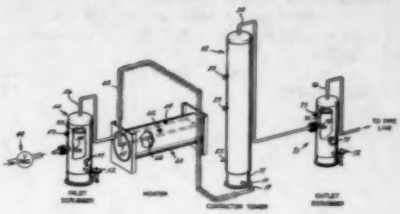
Alvin Samuels, 444 Fairway Dr., New Orleans, La. 70124, assignor to Irwin Fox, Ballwin, Mo.; Alvin Samuels, New Orleans, La. and David Samuels, St. Louis, Mo.

Continuation-in-part of Ser. No. 210,559, Nov. 26, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,525

Int. Cl.³ B01D *50/00*

U.S. Cl. 422—169 **6 Claims**

1. For use in the line of flow from a natural gas well to a pipeline, a system of apparatus comprising in series, inlet scrubber means to separate out water and liquid hydrocarbons, means to raise the temperature of the gas so scrubbed sufficiently to avoid hydrate formation and hydrocarbon liquefaction in the contactor tower next defined, and a contactor tower including gas inlet means in its lower portion, top gas outlet means, a headspace below said top outlet means, and a downward-confining screen positioned at a design dynamic liquid level of a slurry of reactant particles to be filled in the tower,



whereby packer-spacer material may be filled therein to extend upward from the level of the gas inlet means continuously to the screen and be held confined downward by the screen as such slurry expands to the dynamic liquid level on passage of gas therethrough.

4,405,564

TUBULAR REACTION FURNACE FOR INDIRECT HEATING OF CRACKABLE FLUIDS

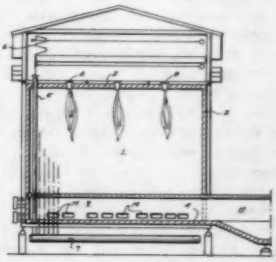
Hans-Joachim Herbort, and Heinz G. Schuster, both of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,318

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145292

Int. Cl.³ B01J *8/06*

U.S. Cl. 422—197 **4 Claims**



1. In a tubular reaction furnace of the type having a firing chamber defined by a ceiling mounting a plurality of internal burners, a floor and including a plurality of vertically oriented reaction tubes arranged in the firing chamber for the indirect heating of crackable fluids, particularly for cracking hydrocarbons used for the extraction of gases rich in CO and H_2, the improvement comprising:

a plurality of flue gas ducts mounted on the floor of the furnace, each flue gas duct including opposed sidewalls and a ceiling;

said sidewalls and ceiling each having a plurality of parallel arranged tubes forming a tube register;

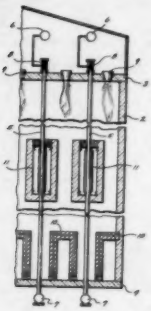
means for insulating the internal and external surfaces of said tube register;

and tubular headers operatively connected to said tube register for the circulation of a cooling medium therethrough.

4,405,565
TUBULAR REACTION FURNACE FOR INDIRECT HEATING OF CRACKABLE FLUIDS

Hans-Joachim Herbort, and Heinz G. Schuster, both of Dortmund, Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,319
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145292
Int. Cl.³ B01J 8/06
U.S. Cl. 422—197 5 Claims



1. In a tubular reaction furnace of the type having a firing chamber defined by opposed walls and provided with internal fuel-gas burners and a plurality of vertically oriented reaction tubes arranged in rows in the firing chamber for the indirect heating of crackable fluids, particularly for cracking hydrocarbons used for the extraction of gases rich in CO and H_2, the improvement comprising:

a plurality of spaced, parallel duct-type beams extending horizontally across the center region and between opposed walls of the firing chamber with the spaces therebetween insuring passage of the fuel gas;

each beam supporting a row of the vertically oriented reaction tubes wherein the reaction tubes penetrate said duct-type beams; and

means for insulating the external surfaces of said duct-type beams and means for affixing the reaction tubes to said duct-type beams.

2. In a tubular reaction furnace of the type having a firing chamber defined by opposed walls and provided with internal fuel-gas burners and a plurality of vertically oriented reaction tubes arranged in rows in the firing chamber for the indirect heating of crackable fluids, particularly for cracking hydrocarbons used for the extraction of gases rich in CO and H_2, the improvement comprising:

a plurality of spaced, parallel duct-type beams extending horizontally across the center region and between opposed walls of the firing chamber with the spaced between said duct-type beams insuring passage of the fuel gas;

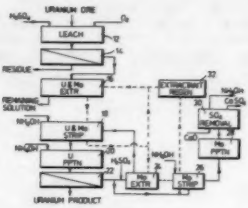
each beam supporting at least one row of the vertically oriented reaction tubes wherein the row of reaction tubes is attached to the external side of said duct-type beam; and

means for insulating the external surfaces of said duct-type beams and means for affixing the reaction tubes to said duct-type beams.

4,405,566
REMOVAL OF URANIUM FROM SULPHATE SOLUTIONS CONTAINING MOLYBDENUM

Donald R. Weir, Fort Saskatchewan, and Roman M. Genik-Sas-Berezowsky, Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Oct. 1, 1980, Ser. No. 192,929
Claims priority, application Canada, Aug. 22, 1980, 358967
Int. Cl.³ C01G 43/00, 39/00, 39/06
U.S. Cl. 423—15 12 Claims

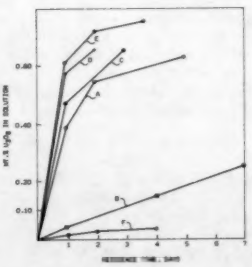


1. A process for recovering uranium values from a sulphate solution containing dissolved uranium and molybdenum and with a pH not exceeding about 5.5, comprising reacting said uranium and molybdenum containing sulphate solution with ammonia at a pH in the range of from about 8 to about 10, without the solution existing for any significant time at a pH of around 7, with resultant precipitation of uranium values relatively uncontaminated by molybdenum, and separating the uranium containing precipitate from the remaining solution while maintaining the pH of the remaining solution within said range.

4,405,567
URANIUM VALUE LEACHING WITH AMMONIUM CARBONATE AND/OR BICARBONATE PLUS NITRATE OXIDANT AND OPTIONALLY OXIDATION-CATALYTIC METAL COMPOUNDS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 20, 1980, Ser. No. 208,717
Int. Cl.³ C22B 60/02
U.S. Cl. 423—17 19 Claims



1. A method for extracting uranium values from solid materials containing uranium in valence states lower than than its hexavalent state, comprising:

contacting said solid materials containing uranium with an aqueous alkaline leach solution selected from the group consisting of solutions of ammonium carbonate, ammonium bicarbonate and mixtures thereof and containing the ionic species NO_3^- in an amount sufficient to convert at

least a portion of said uranium in valence states lower than its hexavalent state to its hexalvalent state.

4,405,568

RECOVERY OF GADOLINIUM AND GALLIUM OXIDES

David Nalewajek, West Seneca, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 20, 1982, Ser. No. 451,297
Int. Cl.³ C01F 17/00; C01G 15/00
U.S. Cl. 423—21.1 3 Claims

1. A method for recovering gadolinium and gallium oxides from by-product material which contains both of these oxides and various impurities comprising the steps of:

(a) thermally treating the oxides to remove organic impurities,

(b) refluxing the gadolinium and gallium oxide in nitric acid,

(c) isolating the filtrate and precipitating gadolinium oxalate from said filtrate by adding thereto oxalic acid,

(d) separating, washing and drying the precipitated gadolinium oxalate,

(e) converting the gadolinium oxalate from step (d) to gadolinium oxide by pyrolysis,

(f) distilling the filtrate from step (c) to reduce the volume and thereby precipitate therefrom gallium nitrate and any gallium oxalate present,

(g) separating the precipitate from step (f),

(h) washing and drying the gallium salts obtained in step (f), and

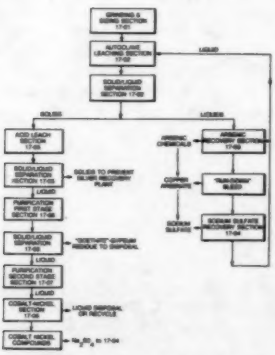
(i) calcining the precipitate from step (h) to form gallium oxide.

4,405,569

HYDROMETALLURGICAL PROCESS FOR EXTRACTING METAL VALUES FROM COMPLEX ORES CONTAINING ARSENIC AND SULFUR

Ulrich Dienstbach, New Liskeard, Canada, assignor to Sulpetro Minerals Limited, Toronto, Canada

Filed Nov. 4, 1981, Ser. No. 318,150
Int. Cl.³ C01G 5/00, 51/00, 28/02; C22B 3/00
U.S. Cl. 423—27 46 Claims



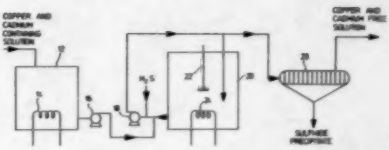
27. In a method for extracting and recovering cobalt, nickel and silver from feedstock derived from complex ore concentrates containing other mineralization including arsenic and sulphur and having a finely particulate character of the order of −400 mesh or thereabouts, the step of subjecting such feedstock to a two-stage oxidative caustic leach, commenced by heating the slurried intial reactants of feedstock and caustic to an elevated temperature of the order of between 85°–100° C., followed by the introduction of finely dispersed oxygen at a pressure of the order of between 120–140 psig and at a temperature of the order of between 120°–150° C. until the reactions are substantially complete followed by the steps of separating and recovering the liquor and solid phases therefrom, and reslurrying said recovered solids with caustic and repeating the introduction of finely dispersed oxygen at said range of pressures and at said range of temperatures until the reactions are substantially complete followed by the steps of separating and recovering the liquor and solids phases therefrom said caustic introduced in each of the aforementioned stages being an amount sufficient to produce in the converted reactants respectively a pH of the order of 13 or greater.

4,405,570

REMOVAL OF DISSOLVED CADMIUM AND COPPER FROM SULPHATE SOLUTION WITH HYDROGEN SULFIDE

Jack Van der Meulen, and Donald R. Weir, both of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sep. 14, 1982, Ser. No. 417,830
Claims priority, application Canada, Jul. 7, 1982, 406794
Int. Cl.³ C01G 3/12, 11/02
U.S. Cl. 423—43 9 Claims



9. A process for selectively removing copper and cadmium ions from nickel and cobalt sulphate solution containing from about 0.1 to about 2 g/L copper, from about 0.05 to about 0.5 g/L cadmium, from about 40 to about 50 g/L nickel and from about 20 to about 50 g/L cobalt, comprising treating the solution at a temperature in the range of from about 85° to about 95° C., and at a pH in the range of from about 4.5 to about 5.5 with hydrogen sulphide to precipitate copper and cadmium sulphides, and removing the precipitated sulphides from the solution.

4,405,571

PROCESS FOR SELECTIVE DISSOLUTION OF MOLYBDENUM IN THE PRESENCE OF TUNGSTEN

Karoly Vadasdi, Korong; Laszlo Bartha, Toldy; Tivadar Millner, Mikszath; Endre Tekula, Dessexffy, and Andras Kiss, Hima, all of Hungary, assignors to MTA Müszaki Fizikai Kutato Intezete, Budapest, Hungary

Filed Jan. 7, 1982, Ser. No. 337,685
Claims priority, application Hungary, Jun. 22, 1979, MA 3152
Int. Cl.³ C01G 39/00, 41/00
U.S. Cl. 423—53 7 Claims

1. A process for the selective dissolution of molybdenum in the presence of tungsten which comprises: dissolving the molybdenum in an aqueous solution, having a pH of from −0.5 to +2.0, of a peroxy compound selected from the group consisting of hydrogen peroxide and ammonium peroxysulfate and in the presence of a catalyst selected from a salt of the group consisting of iron, nickel, copper, silver and thallium.

4,405,572

RECOVERY OF MOLYBDENUM

Calvin E. Moore; Mark E. Hutchinson, and David S. Fetterman, all of Houston, Tex., assignors to MorChem Products, Inc., Hoston, Tex.

Filed Aug. 25, 1982, Ser. No. 411,551
Int. Cl.³ C01G 39/00
U.S. Cl. 423—54 20 Claims

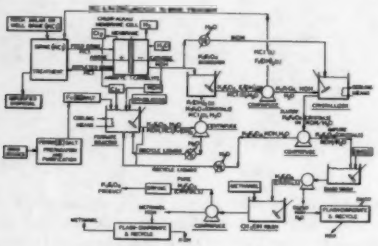
1. A method for separating molybdenum from the liquid

organic oxygen compound containing bottoms fraction of a molybdenum catalyzed olefin epoxidation process comprising adding aqueous alkaline material to the bottoms fraction in an amount sufficient to form an upper first organic phase and a lower alkaline aqueous phase, separating the organic phase from the aqueous phase, the amount of aqueous alkaline material being sufficient to provide a pH of 7.5 to 14 in the lower aqueous phase, acidifying the alkaline aqueous phase after separation from the first organic phase to precipitate the molybdenum, forming a second upper organic phase and a lower aqueous phase, separating the second upper organic phase, and recovering the second organic phase.

4,405,573
PROCESS FOR PREPARING POTASSIUM FERRATE (K_2FEO_4)

J. Paul Deininger, and Ronald L. Dotson, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 17, 1981, Ser. No. 331,949
Int. Cl.³ C01G *49/00*
U.S. Cl. 423—150 **28 Claims**



1. In a process for making a stabilized potassium ferrate which comprises the steps of:
   (a) reacting KOH with Cl_2 and a ferric salt to form a reaction mixture comprising a liquid phase comprising KOH, H_2O and KOCl and a solid phase comprising said potassium ferrate, KCl and $Fe(OH)_3$; and
   (b) separating and recovering said potassium ferrate from said reaction mixture;
wherein said improvement comprises:
   carrying out said reaction step (a) with membrane cell-grade KOH, substantially pure Cl_2 and a substantially pure ferric salt in the presence of a stabilizing proportion of an alkali metal silicate as a ferrate-stabilizing compound.

22. A process for making a dry solid, substantially pure stabilized potassium ferrate product comprising the steps of:
   (a) washing an impure potassium ferrate product in a substantially pure anhydrous first organic solvent selected from the group consisting of dimethylsulfoxide, diethylsulfoxide, dibenzosulfoxide, dimethylsulfone, and sulfolane;
   (b) then washing said potassium ferrate product in a substantially pure anhydrous second organic solvent selected from the group consisting of methanol, ethanol, isopropanol and sec-butanol; and
   (c) then drying the washed potassium ferrate to form said dry solid, substantially pure potassium ferrate product.

4,405,574
REMOVAL OF MG^{++} AND CA^{++} IONS FROM NACL BRINE

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,827
Int. Cl.³ B01J *41/14*
U.S. Cl. 423—157 **20 Claims**

1. Particulate macroporous anion exchange resin composites having post-deposited therein the in-situ reaction product of polymeric amorphous hydrous zirconium oxide and a source of $PO_4^{\equiv}$ ions.

4,405,575
METHOD OF DEFLUORINATING PHOSPHATES

Albert E. Henderson, 10126 Leisure La. North, Jacksonville, Fla. 32216

Filed Apr. 23, 1982, Ser. No. 371,333
Int. Cl.³ C01F *1/00, 5/00;* C01B *25/16;* C05B *11/04*
U.S. Cl. 423—167 **7 Claims**

1. A method for removing fluorine from natural phosphates, Superphosphate materials and wet process phosphoric acids starting materials comprising
   (a) admixing rock phosphate having a fluorine content above that desired with an acid mixture within the range of rock:acid mixture of about 0.8 to 1 and 1:1.4 by weight;
   (b) said acid mixture being substantially concentrated phosphoric acid and concentrated sulfuric acid in a range of phosphoric:sulfuric of about 1:1 to 5:1 by weight;
   (c) said admixing being at a temperature in the range of 215° to 265° F. while adding water in an amount of up to about 12% by weight of the total mixture and then subjecting the above charge;
   (d) in a first heating stage adding (1) recycle in an amount substantially of recycle to charge of 1:1 to 10:1 by weight (2) and water while heating to a temperature in the range of 300° F. to 400° F. for a period of time up to about 6 minutes;
   (e) and in a second heating stage, maintaining the temperature in the range of 400° to 600° F. for a period of time of up to about 6 minutes, and then;
   (f) quickly cooling the resulting product above to a temperature range below about 300° to 200° F. while neutralizing to about 1 to 6% free acid and with addition of at least sufficient amount of water to have water of hydration of substantially 2 to 9% by weight in the final product;
   (g) and, crushing the above resulting product to a desired granular size and separating and returning smaller fine particles as recycle.

4,405,576
REMOVAL OF SULFATE IONS FROM BRINE

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1981, Ser. No. 307,826
Int. Cl.³ B01J *41/12;* C02F *1/42*
U.S. Cl. 423—181 **12 Claims**

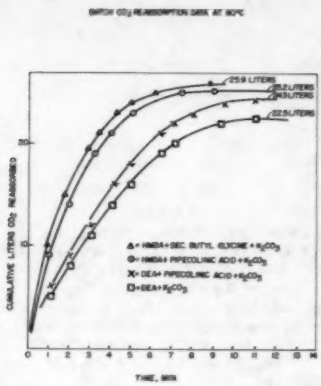
1. Macroporous cation exchange resin beads having sulfonic acid functional groups and having post-deposited therein polymeric hydrous zirconium oxide and polyacrylic acid.

9. A process for removing sulfate, borate, bicarbonate and/or phosphate ions from an aqueous alkali metal salt solution, said process comprising
   contacting said alkali metal salt solution with a macroporous cation exchange resin having sulfonic acid functional groups and having post-deposited therein hydrous zirconium oxide and polyacrylic acid.

4,405,577
NON-STERICALLY HINDERED-STERICALLY HINDERED AMINE CO-PROMOTED ACID GAS SCRUBBING SOLUTION AND PROCESS FOR USING SAME

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 13, 1981, Ser. No. 321,103
Int. Cl.³ B01D 53/34; C09K 3/00
U.S. Cl. 423—223 **16 Claims**



1. A process for the removal of CO_2 from a gaseous stream containing CO_2 which comprises contacting said gaseous stream

(1) in an absorption step absorbing said CO_2 from said gaseous stream with an aqueous absorbing solution comprising

(a) a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and

(b) an activator or promoter system for said basic alkali metal salt or hydroxide, comprising:

(i) at least one non-sterically hindered amino compound, and

(ii) at least one sterically hindered amino acid, and

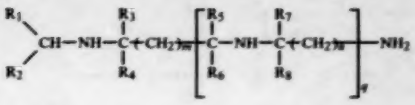
(2) in a desorption and regeneration step, desorbing at least a portion of the absorbed CO_2 from said absorbing solution.

4,405,578
CO-PROMOTED ACID GAS SCRUBBING SOLUTION AND PROCESS FOR USING SAME

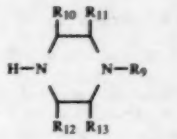
Guido Sartori, Linden, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 13, 1981, Ser. No. 321,060
Int. Cl.³ B01D 53/34; C09K 3/00
U.S. Cl. 423—223 **14 Claims**

1. A process for the removal of CO_2 from a gaseous stream containing CO_2 which comprises contacting said gaseous stream (1) in an absorption step with an aqueous absorbing solution comprising (a) a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and (b) an activator or promoter system for said basic alkali metal salt or hydroxide comprising (i) at least one lower aliphatic mono-substituted amino acid and (ii) at least one sterically hindered diamino or triamino compound, said amino acid being selected from the group consisting of: N-secondary butyl glycine; N-n-butyl glycine, N-2-amyl glycine, N-n-propyl-alpha-alanine, N-secondary butyl-alpha-alanine, and said sterically hindered diamino or triamino compound being represented by the following general formulae:



or

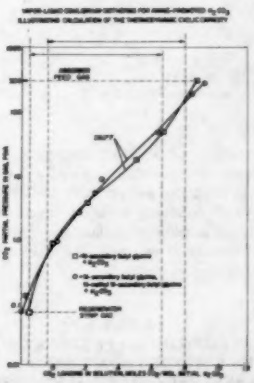


wherein R_1 and R_2 are hydrogen or C_1–C_4 aliphatic radicals or together form a $-CH_2-_p$ chain, wherein p is an integer ranging from 4 to 7, R_3 to R_8 are hydrogen or a methyl radical, R_9–R_{13} are hydrogen, C_1–C_3 alkyl, C_1–C_3 aminoalkyl, C_1–C_3 hydroxyalkyl, or C_1–C_3 carboxylalkyl such that at least one of the groups R_{10} and R_{12} is different from hydrogen, m and n are positive integers ranging from 2–6 and q is zero or a positive integer ranging from 1–3, and (2) in a desorption and regeneration step, desorbing at least a portion of the absorbed CO_2 from said absorbing solution.

4,405,579
STERICALLY HINDERED AMINO ACIDS AND TERTIARY AMINO ACIDS AS PROMOTERS IN ACID GAS SCRUBBING PROCESSES

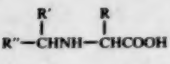
Guido Sartori, Linden, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 13, 1981, Ser. No. 321,061
Int. Cl.³ B01D 53/34; C09K 3/00
U.S. Cl. 423—223 **16 Claims**



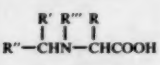
1. A process for the removal of CO_2 from a gaseous stream containing CO_2 which comprises contacting said gaseous stream (1) in an absorption step with an aqueous absorbing solution comprising (a) a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and (b) an activator or promoter system for said basic alkali metal salt or hydroxide comprising (i) at least one sterically hindered monosubstituted amino acid and (ii) at least one

tertiary amino acid, said amino acids being defined by the general formulae:



(sterically hindered monosubstituted amino acid)

and



(tertiary amino acid)

wherein R is either hydrogen or methyl, R′ and R″ are each alkyl or substituted alkyl radicals having 1 to 5 carbon atoms, and R‴ is a linear alkyl or substituted linear alkyl radical having from 1 to 6 carbon atoms; and (2) in a desorption and regeneration step, desorbing at least a portion of the absorbed CO_2 from said absorbing solution.

4,405,580

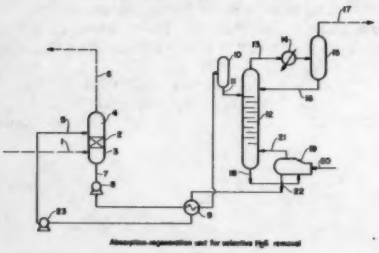
PROCESS FOR SELECTIVE REMOVAL OF H_2S FROM MIXTURES CONTAINING H_2S AND CO_2 WITH TERTIARY AMINO AZABICYCLIC ALCOHOLS

Eugene L. Stogryn, Edison; David W. Savage, Summit, and Guido Sartori, Linden, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,898

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—226 **23 Claims**



FIG

1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising contacting said normally gaseous mixture with an absorbent amino-compound-containing solution comprising a tertiary amino azabicyclic alcohol or tertiary amino azabicyclic ether alcohol under conditions whereby H_2S is selectively absorbed from said mixture.

4,405,581

PROCESS FOR THE SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES WITH SEVERELY STERICALLY HINDERED SECONDARY AMINO COMPOUNDS

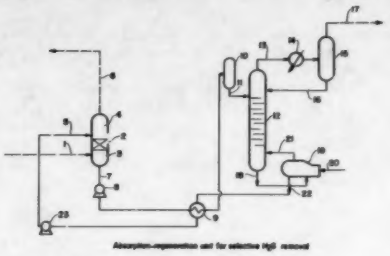
David W. Savage, Summit; Guido Sartori, Linden, and Eugene L. Stogryn, Edison, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,901

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—226 **23 Claims**

1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising contacting normally gaseous mixture with an amino compound solution comprising a severely sterically hindered secondary amino alchol having a cumulative $-E_s$ value (Taft's steric



hindrance constant) greater than about 1.75 under conditions whereby H_2S is selectively absorbed from said mixture.

4,405,582

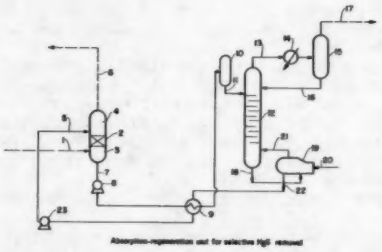
PROCESS FOR SELECTIVE REMOVAL OF H_2S FROM MIXTURES CONTAINING H_2S AND CO_2 USING DIAMINOETHER SOLUTIONS

Eugene L. Stogryn, Edison; David W. Savage, Summit, and Guido Sartori, Linden, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,883

Int. Cl.³ B01D *53/34*; C09K *3/00*

U.S. Cl. 423—228 **23 Claims**



1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising:

(a) contacting said normally gaseous mixture with an absorbent amino-compound-containing solution comprising a diaminoether wherein at least one amino group is a tertiary amine and the other amino group, if not a tertiary amine, is a severely sterically hindered secondary amine, under conditions whereby H_2S is selectively absorbed from said mixture.

4,405,583

PROCESS FOR SELECTIVE REMOVAL OF H_2S FROM MIXTURES CONTAINING H_2S AND CO_2 USING DI-SEVERELY STERICALLY HINDERED SECONDARY AMINOETHERS

Eugene L. Stogryn, Edison; David W. Savage, Summit, and Guido Sartori, Linden, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

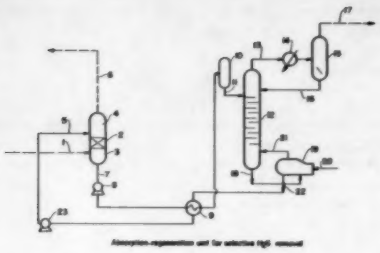
Filed Jan. 18, 1982, Ser. No. 339,900

Int. Cl.³ B01D *53/34*; C09K *3/00*

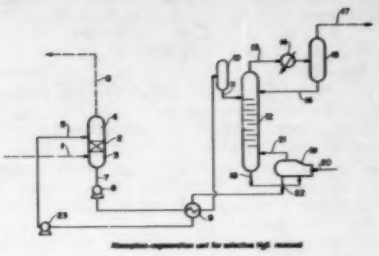
U.S. Cl. 423—228 **23 Claims**

1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising

contacting said normally gaseous mixture with an absorbent amino-compound-containing solution comprising a di-secondary aminoether wherein each amino group is severely sterically hindered under conditions whereby H_2S is selectively absorbed from said mixture.



sterically hindered secondary aminoether alcohol having a cumulative $^{-}E_s$ value (Taft's steric hindrance constant) greater than about 1.75 under conditions whereby H_2S is selectively absorbed from said mixture.

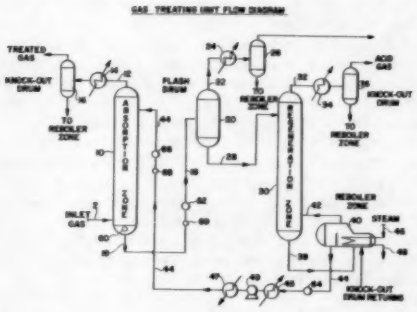


4,405,584

PROCESS FOR REMOVING ACIDIC GASES

Z. Andrew Foroulis, Mendham, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1982, Ser. No. 344,987
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—228 **22 Claims**



1. In a process for removing acidic gases from a gaseous stream containing the same, wherein said gaseous stream is contacted with an amine promoted alkaline salt scrubbing solution, the improvement comprising the combination of the scrubbing solution with an effective amount of a corrosion inhibitor comprising a mixture of salts of antimony and molybdenum.

4,405,585

PROCESS FOR THE SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES WITH SEVERELY STERICALLY HINDERED SECONDARY AMINOETHER ALCOHOLS

Guido Sartori, Linden; David W. Savage, Summit, and Eugene L. Stogryn, Edison, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,891
Int. Cl.[3] B01D *53/34;* **C09K** *3/00*
U.S. Cl. 423—228 **26 Claims**

1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising contacting said normally gaseous mixture with an absorbent amino-compound-containing solution comprising a severely

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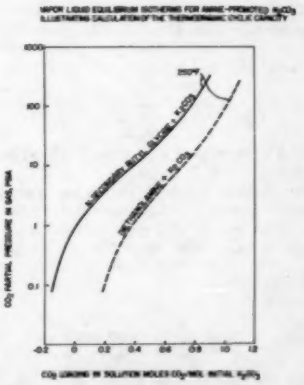
4,405,586

N-SECONDARY BUTYL GLYCINE PROMOTED ACID GAS SCRUBBING PROCESS

Guido Sartori, Linden, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 13, 1981, Ser. No. 321,063
Int. Cl.[3] B01D *53/34;* **C09K** *3/00*
U.S. Cl. 423—233 **14 Claims**



1. A process for the removal of CO_2 from a gaseous stream containing CO_2 which comprises contacting said gaseous stream (1) in an absorption step with an aqueous absorbing solution comprising (a) a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates, and their mixtures, and (b) an activator or promoter system for said basic alkali metal salt or hydroxide comprising N-secondary butyl glycine; and (2) in a desorption and regeneration step, desorbing at least a portion of the absorbed CO_2 from said absorbing solution.

4,405,587

PROCESS FOR REDUCTION OF OXIDES OF NITROGEN

Eugene C. McGill, Skiatook, and Ronald D. Bell, Tulsa, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Filed Feb. 16, 1982, Ser. No. 348,840
Int. Cl.[3] C01B *21/00*; B01D *47/00*
U.S. Cl. 423—235 20 Claims

1. A process for reducing the concentration of oxides of nitrogen in a stream comprising:

burning the stream containing oxides of nitrogen at a temperature greater than about 2000° F. in the presence of a stoichiometric excess of an amount of a reducing agent required for stoichiometric reduction of available oxygen to provide a combustion effluent substantially free of oxides of nitrogen; and

reacting the combustion effluent with a gaseous stream having an effective amount of oxygen to achieve flameless oxidation of the combustibles present in the combustion effluent at a temperature of about 1600° F. to about 1800° F. to produce an oxidation effluent substantially free of oxides of nitrogen.

4,405,588

PROCESS OF REMOVING IRON IMPURITIES FROM ORES

Alejandro J. Caballero, and Ricardo I. Holcombe, both of Monterrey, Mexico, assignors to Materias Primas, Monterrey, S.A., Col. Obispado, Mexico

Filed Dec. 21, 1981, Ser. No. 333,256
Int. Cl.[3] C01B *33/12*
U.S. Cl. 423—340 8 Claims

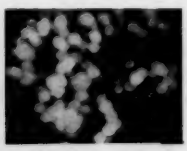
1. A process of removing iron impurities from ores comprising grinding the ore, washing and desliming the ground ore to remove the major part of the clay-type binder, attrition-scrubbing the deslimed particles to release further amounts of binder therefrom, washing and desliming to remove said binder, drying and heating the ore particles, treating the hot particles with a chemical agent suitable to convert the iron impurities into water soluble iron compounds, attrition-scrubbing the hot suspension of chemically treated particles to release the stains of iron impurities thereby forming a hot suspension of the chemically treated particles in said treating agent, and washing with cold water and desliming to recover the purified ore particles.

4,405,589

PROCESS FOR PRODUCING SILICON NITRIDE POWDER

Tadashi Iwai; Takashi Kawahito, and Tetsuo Yamada, all of Ube, Japan, assignors to UBE Industries, Ltd., Japan

Filed Nov. 5, 1982, Ser. No. 439,436
Claims priority, application Japan, Nov. 17, 1981, 56-183081
Int. Cl.[3] C01B *21/06, 33/06*
U.S. Cl. 423—344 5 Claims



1. A process for producing silicon nitride powder comprising the steps of:

(1) reacting (i) at least one compound having the general formula [I]

$$R_mSiCl_{4-m} \quad [I]$$

wherein R is an aliphatic residual group having 1 to 4 carbon atoms or an aromatic residual group having 6 to 8 carbon atoms, and m is 1, 2, or 3 and (ii) a compound having the general formula [II]

$$H_nSiCl_{4-n} \quad [II]$$

wherein n is 0, 1, 2, or 3, the ratio of silicon atom to carbon atom (Si/C) in both compounds [I] and [II] being 0.5 to 50 with ammonia and, then,

(2) calcining the resultant reaction product in the first step at a temperature of 1200° C. to 1700° C. under an inert or reducing gas atmosphere.

4,405,590

DISMUTATION/REDISTRIBUTION OF HALOGENOSILANES INTO SILANE

Gerard Simon, and Andre Soldat, both of Villeurbanne, France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 15, 1982, Ser. No. 358,387
Claims priority, application France, Apr. 3, 1981, 81 06710
Int. Cl.[3] C01B *33/04*
U.S. Cl. 423—347 10 Claims

1. A Process for the dismutation and/or redistribution of at least one halogenosilane comprising at least one Si-H function into silane, which comprises contacting said at least one halogenosilane with a compound comprising at least one α-oxoamine group at a temperature ranging from −30° to 300° C. to effect dismutation and/or redistribution of the halogenosilane to thereby yield silane, silicon tetrahalide or an alkylhalogenosilane or arylhalogenosilane, and residual halogenosilanes, then separating the silane formed by maintaining the reaction products produced in the dismutation and/or redistribution in contact with the compound comprising at least one α-oxoamine group at a temperature at which the reaction products other than silane remain dissolved in said compound comprising at least one α-oxoamine group, and then collecting the separated silane.

4,405,591

HYDROGENATION OF CHLOROSILANES TO SILANE, SiH_4, IN BATH OF MOLTEN SALTS

Jean Grosbois, L'Isle Adam, and Jean-Yves Dumousseau, Paris, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

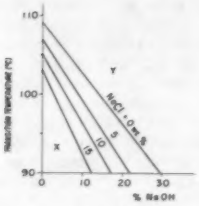
Filed Mar. 17, 1982, Ser. No. 358,853
Claims priority, application France, Apr. 17, 1981, 81 07765
Int. Cl.[3] C01B *33/04*
U.S. Cl. 423—347 4 Claims

1. A process for the preparation of SiH_4 which comprises hydrogenating a chlorosilane in a bath of molten salts, said molten bath being a ternary mixture of lithium chloride/potassium chloride/calcium chloride or lithium chloride/potassium chloride/barium chloride, with said ternary mixture having a melting point not in excess of about 400° C., and said SiH_4 being stable in the molten bath at a higher temperature than that at which SiH_4, prepared by the hydrogenation of a chlorosilane in a molten LiCl/KCl eutectic mixture, is stable in said molten LiCl/KCl eutectic mixture.

4,405,592
PROCESS FOR PRODUCING ANHYDROUS SODIUM CARBONATE CRYSTAL

Keiichi Nakaya, Chiba; Kohji Kawanami, and Suekazu Hirata, both of Ichihara, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 226,166
Claims priority, application Japan, Feb. 1, 1980, 55-10025
Int. Cl.³ C01D 15/08, 7/00, 7/24
U.S. Cl. 423—421 7 Claims

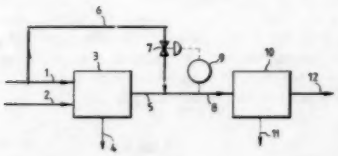


1. A process for producing an anhydrous sodium carbonate crystal which comprises (a) crystallizing substantially at atmospheric pressure an anhydrous sodium carbonate crystal from an aqueous solution of sodium carbonate by adding in said aqueous solution both sodium chloride and sodium hydroxide whereby crystals of anhydrous sodium carbonate of spherical degree ranging from 1.28 to about 1.04 are produced; and (b) separating said crystals of anhydrous sodium carbonate from a mother liquor.

4,405,593
PROCESS OF DECREASING THE SULFUR CONTENT OF EXHAUST GASES OBTAINED DURING THE RECOVERY OF SULFUR

Johann Schlauer, Frankfurt am Main; Herbert Fischer, Lollar, and Manfred Kriebel, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,885
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036132
Int. Cl.³ C01B 17/04
U.S. Cl. 423—574 R 3 Claims



1. A process for decreasing the sulfur content of an exhaust gas released after the recovery of sulfur from an acid gas containing H_2S reacted with an oxygen-containing gas stream in a Claus plant which comprises withdrawing from said Claus plant a tail gas containing H_2S and SO_2 at a molar ratio of up to 2:1, adjusting the molar ratio of H_2S:SO_2 to virtually exactly 2:1 in said tail gas by adding a gas containing H_2S to form a stoichiometric gas mixture, analyzing said stoichiometric gas mixture to determine the concentration of H_2S and SO_2 and, according to said analysis, adjusting the amount of said gas containing H_2S to be added, the maximum amount of said gas containing H_2S added being less than 5% of the acid gas fed into the Claus plant, catalytically reacting said stoichiometric gas mixture to form elementary sulfur and separately withdrawing said elementary sulfur and said residual gas, said gas containing H_2S being added

(i) either to the tail gas exiting from the Claus plant, or

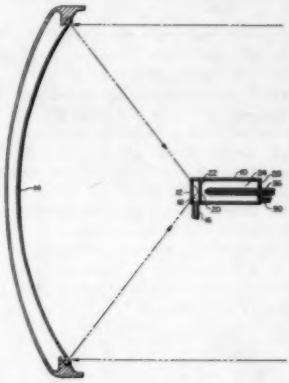
(ii) before the last contacting stage of a multi-stage Claus plant.

3. A process according to claim 1, wherein the tail gases from two or more Claus plants are conducted to a common tail gas-processing plant and jointly desulfurized therein.

4,405,594
PHOTO SEPARATORY NOZZLE

Walter R. Pyle, Richmond, Calif., assignor to Chevron Research Center, San Francisco, Calif.

Filed Sep. 21, 1981, Ser. No. 304,131
Int. Cl.³ C01B 13/00
U.S. Cl. 423—579 6 Claims



5. Apparatus for the thermal dissociation of gaseous matter into its lighter and heavier component species, which comprises:

a housing having a transparent wall;

a solar energy concentration means to direct solar energy through said transparent wall to provide a region of concentrated solar energy within said housing;

an inlet port in said housing for the introduction of gaseous matter into said housing and an outlet orifice in said housing for the removal of effluent component species therefrom, said outlet orifice being positioned near said region of concentrated solar energy and said inlet port being positioned to direct the gaseous matter through said region of concentrated solar energy, said outlet orifice sized for the operating conditions such that the effluent attains supersonic flow after passing through said outlet orifice; and

a separating baffle placed downstream from said outlet orifice for separating the effluent into a heavier component-rich stream and a lighter component-rich stream.

6. A method for thermally dissociating water vapor into hydrogen and oxygen, comprising:

introducing water vapor into a chamber at a first pressure between about 2 and 760 Torr;

heating said water vapor to thermally dissociate at least a portion thereof into hydrogen and oxygen with concentrated solar energy;

passing said hydrogen and oxygen and unconverted water vapor through an orifice at a second pressure between about 1 and 360 Torr, to produce a supersonic molecular jet of hydrogen, oxygen and unconverted water vapor, to produce a shock wave downstream of said orifice, to rapidly cool said hydrogen, oxygen and unconverted water vapor and to retard recombination of same; and

separating said jet in said shock wave into a hydrogen-rich stream and an oxygen-rich stream with a beam skimmer.

4,405,595

METHODS OF PRODUCING SPHERICAL LITHIUM ALUMINATE PARTICLES

Ling Yang, La Jolla; Russell R. Medico, and Wesley A. Baugh, both of San Diego, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jan. 15, 1982, Ser. No. 339,697

Int. Cl.³ C01F *7/04*

U.S. Cl. 423—600 **16 Claims**

6. A method of forming lithium aluminate spheroids comprising:

forming aluminum hydroxide gel spheroids,

washing the gel spheroids with aqueous solution to rid said spheroids of extraneous substances,

immersing said aluminum hydroxide gel spheroids in a solution of between about 3N and about 5N LiOH to infuse lithium ions into said gel spheroids,

rinsing said lithium-infused gel spheroids in an aqueous ammonium hydroxide solution to remove excess lithium ion from the surface thereof,

soaking said lithium-infused gel spheroids in an organic liquid to remove said aqueous solution,

drying said lithium-infused gel spheroids, and

sintering said lithium-infused gel spheroids at a temperature of between about 1000° C. and about 1400° C. to form lithium aluminate spheroids.

4,405,596

PHARMACEUTICAL PREPARATIONS FOR AND TREATMENT PROCEDURES INVOLVING INCREASING PLASMA BICARBONATE LEVEL

Joachim W. Helbig, Traubinger Str.23, D-1832 Tutzing, and Klaus F. Kopp, Aschlkofener Str. 4, D-8017 Ebersberg, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 85,066, Oct. 15, 1979, Pat. No. 4,289,750. This application Sep. 15, 1981, Ser. No. 302,628

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ A61K *33/00, 33/06, 33/14*

U.S. Cl. 424—33 **22 Claims**

1. A pharmaceutical oral dosage form for use in treating altered renal function or prophylactically conditioning against such alterations of an active agent capable of forming or releasing bicarbonate ions and being for increasing plasma bicarbonate level of a subject to a value in excess of that prior to treatment, characterised in that said oral dosage form is substantially free of undesirable side effects known to exist for oral dosage forms of gastro-intestinal bicarbonate-releasing preparations, the active agent being one which forms or releases or which has been adapted in the oral dosage form to form or release resorbable bicarbonate ions only in the intestine of a subject without the possibility of reaction thereof with gastric secretions in the stomach of the subject.

19. A method of preventing severe impediment of renal function or acute renal failure, which comprises the step of orally administering to a patient likely to contract such severe impediment of renal function or renal failure, a prophylactically effective amount of the oral dosage form of claim 1.

4,405,597

MEDICAMENT CAPSULES FOR RECTAL APPLICATION

Yasushi Takagishi, Nishinomiya; Yoshio Doi, Ibaraki; Kiichiro Ohsuga, Kusatsu; Noboru Hoshi, Higashi-kurume, all of Japan, and Shionogi & Co., Ltd., 03, Osaka, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, both of Japan

Filed Aug. 11, 1981, Ser. No. 292,040

Claims priority, application Japan, Feb. 24, 1981, 56-26624

Int. Cl.³ A61K *9/48, 9/36*

U.S. Cl. 424—35 **2 Claims**

1. A method for the administration of a rectally absorbable, therapeutically effective ingredient which comprises inserting into the rectum through the anus a medicament capsule formed of a hard capsule shell made of an enterosoluble material selected from the group consisting of mixed esters of an alkylcellulose, a hydroxyalkylcellulose or a hydroxyalkyl alkylcellulose esterified with acidic succinyl groups and aliphatic monoacyl groups, and encapsulating a liquid content containing the rectally absorbable, therapeutically effective ingredient, the osmotic pressure of the liquid content being substantially higher than the osmotic pressure of the rectal fluid.

4,405,598

COMPOSITION FOR TREATING ASTHMA

Kenneth Brown, East Leake, England, assignor to Fisons, Limited, Ipswich, England

Continuation-in-part of Ser. No. 56,470, Jul. 11, 1979, abandoned, which is a continuation of Ser. No. 868,474, Jan. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 761,445, Jan. 21, 1977, abandoned, and a continuation-in-part of Ser. No. 89,033, Oct. 29, 1979, abandoned, which is a continuation of Ser. No. 920,174, Jun. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,474, Jan. 11, 1978, abandoned. This application Jan. 13, 1981, Ser. No. 224,747

Int. Cl.³ A61K *31/35*

U.S. Cl. 424—45 **3 Claims**

1. A method of treatment of asthma which comprises administration to an asthmatic patient of an effective amount of an inhalation composition comprising a dispersion or suspension of from 0.2 to 2.0% of disodium cromoglycate of mass median diameter 0.01 to 10 microns, from 0.15 to 2.0% by weight of a sorbitan or sorbitol ester surfactant and a propellant mixture comprising dichlorodifluoromethane and 1,2-dichloro-1,1,2,2-tetrafluoroethane and containing substantially no trichloromonofluoromethane, the ratio of dichlorodifluoromethane to 1,2-dichloro-1,1,2,2-tetrafluoroethane in said mixture being in the range from 2:1 to 1:1 by weight, the disodium cromoglycate used in the formulation containing from 0.05 to 1% w/w of water and the total formulation containing less than 0.1% w/w of water and having a vapour pressure in the range 35 to 70 pounds per square inch gauge.

4,405,599

TOOTHPASTE FOR NATURAL TEETH AS WELL AS COMPOSITE FILLING MATERIAL

Irwin E. Smigel, 140 E. 72nd St., New York, N.Y. 10021

Filed Jul. 6, 1982, Ser. No. 395,846

Int. Cl.³ A61K *7/20*

U.S. Cl. 424—53 **7 Claims**

1. A toothpaste composition consisting essentially of, in percent by weight:

Dicalcium Phosphate: 1.0% to 50%
Sorbital 70%: 1.0% to 50%
Cornstarch: 0.5% to 10%
Cellulose Gum: 0.5% to 5.0%
Calcium Peroxide: 0.5% to 5%
Sodium Perborate: 0.5% to 5%
Lathanol LAL: 0.1% to 5%
Aluminum Hydroxide: 0.01% to 1%.

4,405,600

METHODS AND MATERIALS FOR PREVENTION OF CARIOUS DEGRADATION OF TEETH

Frank C. Besic, Manitowoc, Wis., assignor to University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 46,314, Jun. 7, 1979, abandoned. This application Apr. 11, 1980, Ser. No. 139,199

Int. Cl.³ A23K *1/16*

U.S. Cl. 424—57 16 Claims

1. A method for diminishing the cariogenicity of sucrose, said method consisting of admixing sucrose with a soluble source of calcium ions or a soluble source of phosphate ions in a quantitative weight ratio of about one part ion source to forty parts sucrose, said ion source being at least as rapidly soluble in water as sucrose.

16. A cariostatic mouth rinse, the cariostatically active ingredients of which consist of an aqueous solution of a source of calcium ions and an osmotically active agent, the quantities of calcium ions and osmotically active agents in said mouth rinse being such that upon administration to the mouth the osmotically active agent promotes transfer of calcium ions from the mouth into saliva in salivary retention areas in the mouth in quantities such that, taking into account calcium and phosphate ions already present in the saliva, the ratio of calcium ions to phosphate ions therein is from about 0.0666 to about 4.223 and the product of the concentration of calcium ions to phosphate ions therein is from about 0.5 to about 20.

4,405,601

EXTRACTION AND PURIFICATION OF BIOLOGICALLY ACTIVE LYMPHOKINES

John E. McEntire, and Ben W. Papermaster, both of Columbia, Mo., assignors to Cancer Research Center, Columbia, Mo.

Filed May 21, 1981, Ser. No. 265,956

Int. Cl.³ A61K *35/12;* A01N *63/02*

U.S. Cl. 424—95 25 Claims

1. In a method for the extraction and purification of biologically active lymphokines from large scale culture supernatants comprising the steps of effecting the growth of lymphoblastoid cells from human lymphoblastoid cultured cell lines, and thereafter harvesting, concentrating and clarifying the resulting supernatant culture fluids, the improvement which comprises extracting said supernatant culture fluids with a solvent selected from the group consisting of trichloroacetic acid, guanidine hydrochloride, sodium dodecyl sulfate and perchloric acid and removing said solvent to produce a lymphokine fraction which exhibits the capability of inducing cell-mediated immunity reactions and tumor regression in mammals.

4,405,602

PROCESS FOR THE OBTAINMENT OF A BIOLOGICALLY ACTIVE BEE-PRODUCT

Nicolae Ilies, Bucharest, Romania, assignor to Cooperativa Agricola de Productie Scornicesti, Judetul Olt, Romania

PCT No. PCT/RO81/00001, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02106, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 21, 1981, Ser. No. 305,629

Claims priority, application Romania, Jan. 21, 1980, 999/21

Int. Cl.³ A61K *35/64, 47/00;* A23L *1/34*

U.S. Cl. 424—95 8 Claims

1. A process for the preparation of a biologically active bee product under sterile conditions which comprises the steps of:

(a) picking up drone bee larvae, worker bee larvae or queen bee larvae before respective cell capping together with larval food contained in comb cells to form a mixture of crude larval triturate;

(b) triturating the mixture formed during step (a); and

(c) filtering the mixture triturated during step (b) to obtain the desired fresh product.

4,405,603

METHOD FOR RENDERING FACTORS IX AND X HEPATITIS-SAFE WITH CALCIUM IONS

Horst Schwinn; Norbert Heimburger, both of Marburg/Lahn; Gerhardt Kumpe, Wetter, and Wilfried Wormsbächer, Kirchhain, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,872

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045153

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 3 Claims

1. A method for making a preparation containing at least one member selected from the group consisting of blood clotting Factor IX and blood clotting Factor X virtually hepatitis-safe, which method comprises warming said preparation in the presence of an effective amount of calcium ions and in the further presence of an effective amount of at least one member selected from the group consisting of amino acids, saccharides, and sugar alcohols.

4,405,604

VETERINARIAN SALVE

John T. Sunley, R.R. #6, Springfield, Ill. 62707

Filed Sep. 9, 1982, Ser. No. 347,051

Int. Cl.³ A61K *33/04*

U.S. Cl. 424—165 5 Claims

1. A veterinarian salve, comprising a mixture of an oil base as the principal ingredient, flowers of sulfur, and sufficient creolin to tastewise discourage dogs from licking-off an application of said salve to a treatment area.

4,405,605

FUNGICIDAL COMPOSITIONS

Hanshelmut Itzel, Gau-Algesheim, Fed. Rep. of Germany, assignor to Celamerck GmbH & Co., KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 219,246, Dec. 22, 1980. This application Jul. 24, 1981, Ser. No. 286,693

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 2952239

Int. Cl.³ A01N *43/50, 43/48, 25/22*

U.S. Cl. 424—173 15 Claims

1. A fungicidal composition comprising fungicidally effective amounts of triforine and carbendazim as active ingredients, wherein the composition consists essentially of (1) from about 1 to 40 percent by weight, based upon the weight of the total composition, of carbendazim suspended in a solution of from about 1 to 20 percent by weight, based upon the weight of the total composition, of triforine in dimethylformamide, N-methylpyrrolidone, or a mixture thereof; (2) from about 1 to 40 percent by weight, based upon the weight of the total composition, of saccharide or from about 1 to 15 percent by weight, based upon the weight of the total composition, of a polyvinylpyrrolidone/polyvinylacetate mixture, the weight ratio of polyvinylpyrrolidone to polyvinylacetate in the mixture being from about 4:1 to 1:4, or a mixture thereof, as stabilizer; and (3) inert carrier.

4,405,606

METHOD FOR ARRESTING FULMINATING INFECTION

Anthony Cerami, Flanders, N.J., assignor to Evreka, Inc., Bergenfield, N.J.

Filed May 4, 1981, Ser. No. 260,144

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 8 Claims

1. A method for arresting fulminating infection of traumatized tissue in animals comprising administering to said tissue an agent capable of binding iron made available to infection-promoting organisms by body fluid released by the traumatization of said tissue, said agent administered in an amount suffi-

cient to bind all of said available iron, and thereby to block the adsorption of said iron by said organisms,

wherein said agent comprises at least one complexing protein, and said complexing protein comprises haptoglobin.

4,405,607

NOVEL PENTAPEPTIDES, PROCESSES FOR THEIR PRODUCTION, PHARMACEUTICAL COMPOSITIONS COMPRISING SAID PENTAPEPTIDES AND THEIR USE

Francois Cardinaux; Rene Huguenin, both of Reinach, and Janos Pless, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jul. 10, 1981, Ser. No. 282,045

Claims priority, application Switzerland, Jul. 17, 1980, 5483/80; Nov. 26, 1980, 8752/80

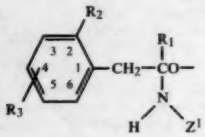
Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **15 Claims**

1. A pentapeptide of formula I,

A—B—Gly—D—E I

wherein A is a residue of formula



wherein

Z^1 is amidino,

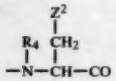
R_1 is hydrogen or C_{1-4} alkyl,

R_2 is hydrogen,

R_3 is hydroxy in the 4-position;

B is (D)-Ala

D is a residue of formula

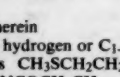


wherein

R_4 is hydrogen or C_{1-4} alkyl and

Z^2 is phenyl or phenyl mono- or di-substituted by halogen, nitro, C_{1-4} alkyl or C_{1-4} alkoxy and

E is a group of the formula



wherein

R_5 is hydrogen or C_{1-4} alkyl and

R_6 is $CH_3SCH_2CH_2$—, $HOCH_2$—, CH_3—CH(OH)— or $H_2NCOCH_2CH_2$—, a group of formula

$$-(CH_2)_m-CH_2OH$$

wherein m is an integer of from 1 to 6, or a group of formula

$$-(CH_2)_n-CH_2-S(O)_p-R_7$$

wherein

R_7 is C_{1-5} alkyl and n and p, each independently of the other, are zero, 1 or 2, with the proviso that, when n is 1 and p is zero, R_7 is other than methyl;

where the residues A and D have the (L)-configuration, and the residue E has the (D)- or (L)-configuration or a physiologically hydrolysable, physiologically acceptable ester thereof or a salt or complex of the pentapeptide or ester pharmaceutically acceptable.

4,405,608

NOVEL PEPTIDE

Alister J. Moody, Skovbovej; Lars Thim, Skiftevej, and Karin D. Jorgensen, Skovvej, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Aug. 27, 1981, Ser. No. 296,839

Int. Cl.³ C07C *103/52;* **A61K** *35/39, 35/38, 37/02*

U.S. Cl. 424—177 **4 Claims**

1. A purified peptide having the following amino acid sequence:

Arg—Ser—Leu—Gln—Asn—Thr—Glu—Glu—Lys—Ser—
5 10

—Arg—Ser—Phe—Pro—Ala—Pro—Gln—Thr—Asp—Pro—
15 20

—Leu—Asp—Asp—Pro—Asp—Gln—Met—Thr—Glu—Asp
25 30

and the physiologically acceptable salts thereof.

4,405,609

COMBINATION AND METHOD FOR INCREASING FEED UTILIZATION EFFICIENCY IN RUMINANTS

Emerson L. Potter, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 397,325, Jul. 12, 1982, abandoned, which is a continuation of Ser. No. 227,572, Jan. 22, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,791

Int. Cl.³ A61K *37/00, 31/71*

U.S. Cl. 424—177 **29 Claims**

1. A composition useful for improving the efficiency of feed utilization by ruminants having a developed rumen function comprising as a first component a polyether antibiotic and as a second component a glycopeptide antibiotic, said components being present in combination in amounts which are about their respective optimal dose levels when employed alone, or are suboptimal dose levels which interact to increase feed utilization efficiency.

2. A composition of claim 1 comprising as a first component a propionate-increasing amount of a polyether antibiotic selected from monensin, ionomycin, laidlomycin, nigericin, grisorixin, dianemycin, Compound 51,532, lenoremycin, salinomycin, narasin, lonomycin, X-206, alborixin, septamycin, A-204, Compound 47,224, etheromycin, lasalocid, mutalomycin, K41, isolasalocid A, lysocellin, X-14766A, A-23187 or A-32887, and a second component which is a glycopeptide antibiotic selected from actaplanin, avoparcin, A35512, A477, ristocetin, or vancomycin.

4,405,610

DRUG FOR CURING INFLAMMATORY AND/OR DEGENERATIVE AND/OR ATROPHIC MUCOUS-MEMBRANE DISEASES

Hrvoje Krnjevic, A. Santica 2/II, 41.000 Zagreb, Yugoslavia

Filed Mar. 25, 1981, Ser. No. 247,375

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011437

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **7 Claims**

1. An anti-inflammatory, degenerative, anti-atrophic drug against mucous-membrane diseases, characterized by a proportion of:

(a) the nucleoside inosine (hypoxanthine riboside), and

(b) lysine orotate,

whereby 1.5 ml of a solution of the active substances with a

concentration of 3 mg/ml in water is administered per 0.25 kg of body weight, by means of a syringe; or whereby two times per day 25 mg of the active substances per person are administered orally; or whereby topical treatment is carried out with a solution of 1–3 mg of the active substances per ml of water.

2. The drug as set forth in claim 1, characterized in that it contains vitamin A (water-soluble form) at 250 JU/ml or grams, and/or vitamin B_{12} at 0.05 mg/ml or grams, and/or folic acid at 0.05 mg/ml or grams.

3. The drug as set forth in claim 1 or 2, characterized in that it contains vitamin A at 250 JU/ml or grams, and/or thymine (=a pyrimidine base) at $\frac{1}{4}$ of the lysine orotate dose.

4,405,611

BISULFITE STABILIZATION OF 5-AZACYTIDINE

Dulal C. Chatterji, Germantown, and Joseph F. Gallelli, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 163,521, Jun. 27, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 331,989

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **2 Claims**

1. In a method of administering 5-azacytidine internally in mice, the improvement comprising the steps of:

(a) a stabilizing the 5-azacytidine by forming a pro-drug form which has a bisulfite addition compound across the 5–6 imine double bond at about a pH of 2.5, and

(b) infusing the pro-drug of 5-azacytidine into the body wherein the physiological environment of the body at a pH >6 restores the pro-drug to the active 5-azacytidine form.

4,405,612

HEPARIN WEB COMPOSITIONS

Charles G. Thiel, St. Paul, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 152,751, May 23, 1980, abandoned. This application May 21, 1981, Ser. No. 267,579

Int. Cl.³ A61K *31/725;* **D04H** *1/04;* **C08B** *37/10*

U.S. Cl. 424—183 **24 Claims**

4. A microfiber of an amorphous salt of heparin and a cation selected from groups I and II of the periodic table of the elements which has an average length to diameter ratio of at least 20.

4,405,613

BIOLOGICALLY ACTIVE EXTRACTS FROM *MAYTENUS NEMEROSA* (ECKL AND ZEYH) MORAIS (CELASTRACEAE) SOUTH AFRICA AND METHOD OF OBTAINING SAME

Sidney M. Hecht, 101 Georgetown Green, Charlottesville, Va. 22901

Continuation of Ser. No. 280,085, Jul. 2, 1981, abandoned. This application Jul. 23, 1982, Ser. No. 401,305

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 **9 Claims**

1. Biologically active materials from the plant *Maytenus nemerosa*, Eckl & Zeyh, Morais, Celastraceae, South Africa, the materials being produced by the process comprising extracting the twigs, bark and wood portions of the plant with a first solvent having a dielectric constant at 20° to 25° C. of from about 1.8 to about 2.0, a second solvent having a dielectric constant at 20° to about 25° C. of from about 3.5 to about 5.0, each extraction step being conducted for a period of 1 to 10 days, all extraction steps being conducted at room temperature, and recovering the biologically active materials which are capable of killing tumor cells derived from human carcinoma of the nasopharynx.

5. A process of obtaining biologically active materials from the plant *Maytenus nemerosa*, Eckl & Zeyh, Morais Celastraceae, South Africa, comprising extracting the twigs, bark and wood portions of the plant with a first solvent having a dielectric constant at 20° to 25° C. of from about 1.8 to 2.0, a second solvent having a dielectric constant at 20° to about 25° C. of from about 3.5 to about 5.0, each extraction step being conducted for a period of 1 to 10 days, all of the extraction steps being conducted at room temperature, and recovering the biologicaly active materials which are capable of killing tumor cells derived from human carcinoma of the nasopharynx.

4,405,614

N-SULFONYLATED THIOLPHOSPHORIC ESTER AMIDES AND THEIR USE FOR CONTROLLING PESTS

Hans-Peter Loeffler; Walter Seufert, both of Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

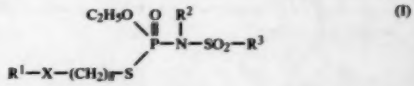
Filed Mar. 10, 1982, Ser. No. 356,722

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112064

Int. Cl.³ C07F *9/24;* **A01N** *57/28*

U.S. Cl. 424—215 **9 Claims**

1. An N-sulfonylated thiolphosphoric ester amide of the formula



(I)

where R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl of up to 6 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms or dialkylamino where alkyl is of 1 to 6 carbon atoms, X is oxygen or sulfur, and n is 1 or 2.

9. A process for combating insects, arachnida and/or nematodes, wherein an effective amount of an N-sulfonylated thiolphosphoric ester amide of the formula I as defined in claim 1 is allowed to act on them and/or their habitat.

4,405,615

COMPOSITION FOR TREATMENT OF PSORIASIS CONTAINING 10-SUBSTITUTED 1,8-DIHYDROXY-9-ANTHRONES

Braham Shroot, Antibes; Jean Maignan, Tremblay les Gonesse, and Gerard Lang, Epinay-sur-Seine, all of France, assignors to Groupement d'Interet Economic dit: Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

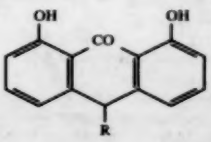
Filed Dec. 14, 1981, Ser. No. 330,472

Claims priority, application France, Dec. 15, 1980, 80 26550

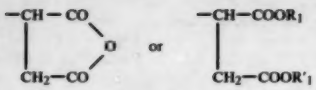
Int. Cl.³ A61K *31/625*

U.S. Cl. 424—232 **21 Claims**

1. A method of treating a patient suffering from psoriasis which comprises topically administering to the skin of said patient in a suitable vehicle a dose effective for the attenuation of psoriasis of at least one compound of the formula:



wherein R is



wherein R_1 and R'_1 are identical or diffrent and represent H, methyl or ethyl.

4,405,616

PENETRATION ENHANCERS FOR TRANSDERMAL DRUG DELIVERY OF SYSTEMIC AGENTS

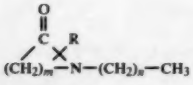
Vithal J. Rajadhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation-in-part of Ser. No. 260,201, May 4, 1981, abandoned, which is a continuation of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jul. 19, 1975, Pat. No. 3,989,816. This application May 20, 1982, Ser. No. 380,161

Int. Cl.³ A61K *31/33*

U.S. Cl. 424—244 **7 Claims**

1. In a method for topically administering systemically active agents through the skin or mucosal membranes of humans and animals in a transdermal device or formulation, the improvement comprising the topical administration of an effective amount of a membrane penetration enhancer having the structural formula



where R is H or a lower alkyl group having 1–4 carbon atoms, m is 5 and n is 0–17.

4,405,617

3-(PROPYNYLTETRAZOL)THIOMETHYL-3-CEPHEMS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Masayoshi Murata, Mino, and Hisashi Takasugi, Kohamanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

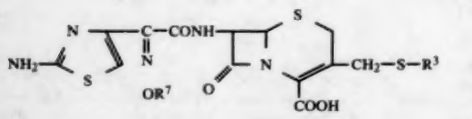
Filed Feb. 2, 1981, Ser. No. 230,675

Claims priority, application United Kingdom, Feb. 11, 1980, 8004477; Jun. 13, 1980, 8019376

Int. Cl.³ A61K *31/545*; C07D *501/56*

U.S. Cl. 424—246 **12 Claims**

1. A new cephem compound of the formula:



wherein

R^7 is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, cyclo(lower)alkenyl,

phenyl(lower)alkyl, or carboxy(lower)alkyl; and

R^3 is 1-(2-propynyl)-1H-tetrazol-5-yl or 2-(2-propynyl)-2H tetrazol-5-yl.

12. An antimicrobial pharmaceutical composition comprising an effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,405,618

THIAZOLIDINE DERIVATIVES WITH ANTIBIOTIC ACTIVITY

Michele Di Schiena, and Vittoria Orru, both of Trezzano sul Naviglio, Italy, assignors to Ausonia Farmaceutici s.r.l., Rome, Italy

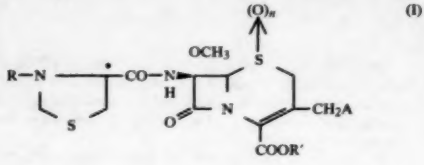
Filed Jul. 1, 1981, Ser. No. 279,454

Claims priority, application Italy, Jul. 15, 1980, 23455 A/80

Int. Cl.³ C07D *501/57*; A61K *31/545*

U.S. Cl. 424—246 **5 Claims**

1. An antibiotically active compound of formula I



(I)

wherein

R is hydrogen;

R′ is hydrogen, a pharmaceutically acceptable inorganic or organic cation;

A is O—CO—NH_2;

n is 1,

The asymmetric C-atom (*) of the thiazolidine nucleus having the D- or L-configuration or being in the racemic form.

4,405,619

ANTIINFLAMMATORY SUBSTITUTED-1,2,4-TRIAZOLO[4,3-b]-1,2,4-TRIAZINES

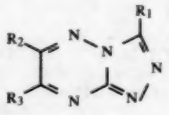
William P. Heilman, Chagrin Falls, and James M. Gullo, Perry, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Sep. 2, 1981, Ser. No. 298,789

Int. Cl.³ C07D *487/04*; A61K *31/41*

U.S. Cl. 424—249 **19 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

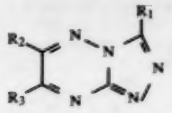
R_1 represents hydrogen, alkyl, haloalkyl, alkoxy, alkoxyalkyl, hydroxy, cycloalkyl, phenyl, halophenyl, alkylphenyl or alkoxyphenyl;

R_2 is hydrogen, alkyl, phenyl or pyridyl; and

R_3 is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, alkoxyaryl, hydroxyaryl or pyridyl;

subject to the provisos that when R_3 is alkyl, phenyl or halophenyl or alkoxyphenyl, R_1 is other than hydrogen, alkyl, phenyl or alkoxyphenyl and when R_2 and R_3 are both phenyl, R_1 is other than hydrogen or phenyl; wherein the terms alkyl and alkoxy as used herein are inclusive of straight and branch chain carbon-carbon linkages and represent 1 to 5 carbon atoms and the term aryl as used herein represents a carbocyclic ring of 6 to 10 carbon atoms.

16. A method of obtaining an analgesic effect in an animal in need thereof comprising administering thereto an analgesic effective amount of an active ingredient containing a compound or mixture of compounds of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein R_1 represents hydrogen, alkyl, haloalkyl, alkoxy, alkoxyalkyl, hydroxy, cycloalkyl, phenyl, halophenyl, alkylphenyl or alkoxyphenyl; R_2 is hydrogen, alkyl, phenyl or pyridyl; and R_3 is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, alkoxyaryl, hydroxyaryl or pyridyl; wherein the terms alkyl and alkoxy as used herein are inclusive of straight and branch chain carbon-carbon linkages and represent 1 to 5 carbon atoms and the term aryl as used herein represents a carbocyclic ring of 6 to 10 carbon atoms.

4,405,620

PIPERAZINE DERIVATIVES

Derek R. Buckle, Redhill, and Harry Smith, Maplehurst Nr. Horsham, both of England, assignors to Beecham Group Limited, England

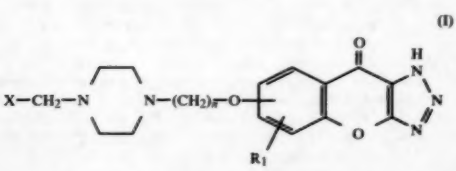
Filed Jan. 19, 1981, Ser. No. 227,621

Claims priority, application United Kingdom, Jan. 19, 1980, 8001856; Jul. 25, 1980, 8024454

Int. Cl.³ C07D *413/00;* **A61K** *31/495*

U.S. Cl. 424—250 **9 Claims**

1. A compound of formula (I)



(I)

wherein X is phenyl, optionally substituted by one halogen, C_{1-4} alkyl, or C_{1-4} alkoxy; or pyridyl; R_1 is hydrogen or C_{1-6} alkyl; and n is 1 to 6; or a pharmaceutically acceptable salt thereof formed with the acidic hydrogen atom of the triazole moiety or with the amino moieties.

4,405,621

HETEROCYCLIC THIOUREAS, ISOTHIOUREAS, GUANIDINES AND NITROMETHYLENE-AMIDINES

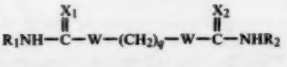
Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 70,950, Aug. 30, 1979, Pat. No. 4,301,165, which is a division of Ser. No. 941,836, Sep. 11, 1978, Pat. No. 4,197,305, which is a division of Ser. No. 836,626, Sep. 26, 1977, Pat. No. 4,137,319, which is a division of Ser. No. 678,564, Apr. 20, 1976, Pat. No. 4,070,472, which is a division of Ser. No. 542,971, Jan. 22, 1975, Pat. No. 3,968,227. This application Jun. 11, 1981, Ser. No. 272,811

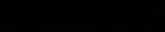
Int. Cl.³ C07D *285/06, 285/08, 285/10, 285/12, 237/22, 239/42, 241/20;* **A61K** *31/41, 31/50, 31/505, 31/495*

U.S. Cl. 424—250 **11 Claims**

1. A compound of the formula:



wherein R_1 and R_2, which are the same, each represent a grouping of the structure:



wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from thiadiazole, pyrimidine, pyrazine or pyridazine which is optionally substituted by lower alkyl, hydroxyl, halogen or amino; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3 and the sum of m and n is 3, 4 or when Y is other than hydrogen, methyl, or hydroxyl, 2; X_1 and X_2, which may be the same or different, are each sulphur, $CHNO_2$ or NY wherein Y is hydrogen, hydroxy, lower alkyl, cyano, $CONH_2$ or SO_2R_3; R_3 is lower alkyl, phenyl, tolyl, trifluoromethyl or amino; W is NH, and when X_1 and X_2 are NH, W may also be sulphur; and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

4,405,622

[1-(1,4-BENZODIOXAN-2-YL)-4-(4-AMINOPYRIMIDIN-2-YL]PIPERAZINES USEFUL AS ANTI-DEPRESSANTS

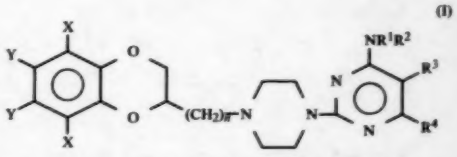
Arthur F. Kluge, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 16, 1980, Ser. No. 197,425

Int. Cl.³ A61K *31/495;* **C07D** *405/14*

U.S. Cl. 424—250 **9 Claims**

1. A composition for reducing, inhibiting or preventing depression in humans which comprises an effective amount of a compound of the formula



(I)

or the pharmaceutically acceptable acid addition salts thereof wherein:

R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl;

X and Y are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy or halogen; and n is either 0, 1 or 2, in admixture with at least one pharmaceutically acceptable excipient.

4,405,623

QUINAZOLINDE-DIONE COMPOUNDS, PROCESS FOR PRODUCTION THEREOF AND PHARMACEUTICAL USE THEREOF

Masayuki Ishikawa, 14-13, Akazutsumi 3-chome, Setagaya-ku, Tokyo; Akiko Sugimoto, Hino; Yukuo Eguchi, Chiba; Fujinori Sasaki, Yokohama; Hisashi Ebisawa, Chofu; Soyao Moriguchi, and Katsuhiko Gotoh, both of Yokohama, all of Japan, assignors to Masayuki Ishikawa, Tokyo, Japan

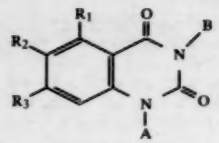
Filed May 15, 1981, Ser. No. 263,898

Claims priority, application Japan, May 15, 1980, 55/63328; May 22, 1980, 55/67085; Jun. 17, 1980, 55/80843; Jun. 30, 1980, 55/87715; Jul. 28, 1980, 55/102396; Jul. 28, 1980, 55/102397; Aug. 5, 1980, 55/106748; Aug. 11, 1980, 55/109212

Int. Cl.³ C07D *239/80;* **A61K** *31/505*

U.S. Cl. 424—251 **14 Claims**

14. A vasodilating and hypotensive composition composed of an effective amount of a compound selected from 5,6,7-substituted-2,4(1H,3H)-quinazolinedione compounds and their pharmaceutically acceptable acid addition salts, and a pharmaceutically acceptable diluent or carrier, said quinazolinedione compound being of the following formula



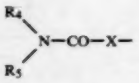
wherein

R_1 and R_3 independently represent (lower)alkyl;

R_2 represents (lower)alkoxycarbonyl;

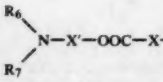
B represents a (lower)alkyl, phenyl or phenyl substituted by one or two members selected from the group consisting of halogen atoms, (lower)alkyl, (lower)alkoxy, di(lower)alkylamino, methylenedioxy, trifluoromethyl, and nitro; and

A represents a member selected from the group consisting of (a) a hydrogen atom, (b) (lower)alkyl, (c) carboxy(lower)alkyl, (d) (lower)alkoxycarbonyl(lower)alkyl, (e) hydroxy(lower)alkyl, (f) benzyl, (g) benzyl substituted by (1) nitro or (2) (lower)alkoxy, (h) pyridylmethyl, (i) disubstituted-amino (lower)alkyl substituted by (1) two (lower)alkyl or (2) one (lower)alkyl and one of benzyl, tetramethylene, pentamethylene, pentamethylene substituted by (lower)alkyl, hexamethylene or heptamethylene, said methylene forming a heterocycle together with the nitrogen atom of the amino (lower)alkyl, (j) (lower)alkyl bearing a piperidine or pyrrolidine ring, the nitrogen atom of which is substituted by a (lower)alkyl, (k) a moiety of the formula



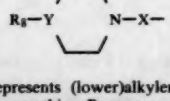
wherein X represents (lower)alkylene, R_4 represents a hydrogen atom or (lower)alkyl, R_5 represents a hydrogen atom, (lower)alkyl, di(lower)alkylamino(lower)alkyl, benzyl, piperidino(lower)alkyl, morpholino(lower)alkyl, (1-piperazinyl)(lower)alkyl, (4-(lower)acyl-1-piperazinyl)(lower)alkyl, or (4-carbamoyl-1-piperazinyl)(lower)alkyl, the carbamoyl of which may be N-mono- or disubstituted by (lower)alkyl or phenyl, and R_4 and R_5 can form together with the nitrogen atom a piperidine or 4-(lower)alkylpiperazine ring,

(l) a moiety of the formula



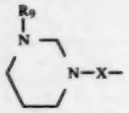
wherein X' and X represent independently (lower)alkylene, R_6 represents (lower)alkyl, R_7 represents (lower)alkyl, benzyl, piperidino(lower)alkyl, or morpholino(lower)alkyl, and R_6 and R_7 can form together with the nitrogen atom a piperidine ring,

(m) a moiety of the formula



wherein X represents (lower)alkylene, Y represents a nitrogen atom or methine, R_8 represents a hydrogen atom, (lower)alkyl, phenyl, phenyl(lower)alkyl, or phenyl(lower)alkene, the phenyl groups of which may be mono- or disubstituted by a chlorine atom, methoxy, benzoyl, benzoyl substituted by a halogen atom, nitro or methoxy, phenylacetyl, benzyloxycarbonyl, cinnamoyl, thenoyl, furoyl, or N-phenylcarbamoyl, provided that when Y is a methine R_8 is not hydrogen nor alkyl, and

(n) a moiety of the formula



wherein X represents (lower)alkylene, and R_9 represents phenyl or benzyl;

or an acid addition salt thereof.

4,405,624

NITRO-SUBSTITUTED DIHYDROPYRROLES AND TETRAHYDROPYRIDINES, COMPOSITIONS, COMPOUNDS, AND MEDICINAL USE

Michael L. Roantree, Welwyn Garden City, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

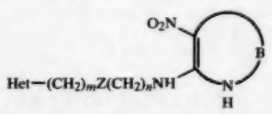
Division of Ser. No. 159,525, Jun. 16, 1980, Pat. No. 4,324,789, which is a division of Ser. No. 43,785, May 30, 1979, Pat. No. 4,238,493. This application Dec. 2, 1981, Ser. No. 326,877

Int. Cl.[3] **C07D** *207/22, 211/72;* **A61K** *31/44, 31/40*

U.S. Cl. 424—256 **3 Claims**

1. A compound represented by Structure 1:

Structure 1



in which

Het is selected from the group consisting of furyl and thienyl rings each substituted by a group R^1R^2N—A where R^1 and R^2, which can be the same or different, are each hydrogen, lower alkyl, C_3–C_6 cycloalkyl, lower alkenyl, phenyl lower alkyl, lower alkyl substituted by lower alkoxy, (lower alkyl)amino or di(loweralkyl)amino, or R^1 and R^2 together with the nitrogen atom to which they are attached form pyrrolidino or piperidino ring, and A is straight or branched C_1–C_6 alkanediyl group;

Z is sulphur, methylene or oxygen;

m is 0, 1 or 2 and n is 2 or 3 provided that m+n is 3 or 4; and

B is 1,2-ethanediyl (—CH_2—CH_2—) or 1,3-propanediyl (—$CH_2CH_2CH_2$—) group, which group is optionally substituted with one lower alkyl, aryl, aryl lower alkyl or heteroaryl lower alkyl group, aryl being phenyl optionally substituted by lower alkyl, lower alkoxy or halogen and heteroaryl being 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl optionally substituted by lower alkyl or lower alkoxy, or a pharmaceutically acceptable acid addition salt thereof.

4,405,625

METHOD OF TREATING HYPERGLYCEMIA WITH 1,3-DIOXO-1H-BENZ[de]ISOQUINOLINE-2(3H)-ACETIC ACID

Wilbur Lippmann, Montreal, Canada, assignor to Ayerst, McKenna and Harrison Limited, Montreal, Canada

Continuation of Ser. No. 862,801, Dec. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 818,379, Jul. 25, 1977, Pat. No. 4,118,495. This application Jun. 4, 1979, Ser. No. 45,376

Int. Cl.³ A61K *31/47*

U.S. Cl. 424—258 11 Claims

1. A method for lowering blood glucose levels in a diabetic mammal suffering from hyperglycemia which comprises administering to said mammal a hypoglycemically effective amount of 1,3-dioxo-1H-benz[de]isoquinoline-2(3H)-acetic acid or a therapeutically acceptable salt thereof.

4,405,626

9-HYDROXYOCTAHYDROBENZO(C)QUINOLINES ANALGESIC COMPOSITIONS CONTAINING THEM AND PROCESSES FOR PRODUCING ANALGESIC WITH THEM

Michael R. Johnson, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

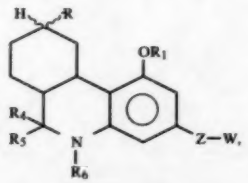
Division of Ser. No. 193,822, Oct. 3, 1980, Pat. No. 4,340,737, which is a division of Ser. No. 42,773, May 29, 1979, Pat. No. 4,260,764, which is a continuation-in-part of Ser. No. 777,928, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 753,619, Dec. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 687,332, May 17, 1976, abandoned. This application Dec. 9, 1981, Ser. No. 328,960

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ A61K *31/47*; C07D *221/12*

U.S. Cl. 424—258 45 Claims

22. A process for producing analgesia in a mammal which comprises administering to the mammal an analgesic producing quantity of a compound selected from the group consisting of those having the formula



and the pharmaceutically acceptable acid addition salts thereof,

wherein R is selected from the group consisting of hydroxy, alkanoyloxy having from one to five carbon atoms and hydroxymethyl;

R_1 is selected from the group consisting of hydrogen, benzoyl, alkanoyl having from one to five carbon atoms and —CO—$(CH_2)_p$—NR_2R_3 wherein p is 0 or an integer from 1 to 4; each of R_2 and R_3 when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_2 and R_3 when taken together with the nitrogen to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from one to four carbon atoms in the alkyl group;

R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms and —$(CH_2)_z$—C_6H_5 wherein z is an integer from 1 to 4;

R_5 is selected from the group consisting of hydrogen, methyl and ethyl;

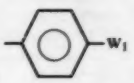
R_6 is selected from the group consisting of hydrogen, —$(CH_2)_y$—carbalkoxy having from one to four carbon atoms in the alkoxy group and wherein y is 0 or an integer from 1 to 4, carbobenzyloxy, formyl, alkanoyl having from two to five carbon atoms, alkyl having from one to six carbon atoms and —$(CH_2)_x$—C_6H_5 wherein x is an integer from 1 to 4; and $CO(CH_2)_{x-1}$—C_6H_5;

Z is selected from the group consisting of

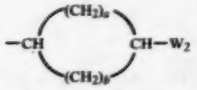
(a) alkylene having from one to nine carbon atoms;

(b) —$(alk_1)_m$—X—$(alk_2)_n$— wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and

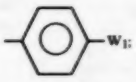
W is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5

4,405,627

DIPHENYLPROPYLAMINO-PYRIDINE COMPOUNDS USEFUL AS MEDICINES

Paolo Masi, Bologna; Angela Monopoli, Milan; Adone C. Saravalle, Milan, and Cesare Zio, Milan, all of Italy, assignors to Italiana Schoum S.p.A., Milan, Italy

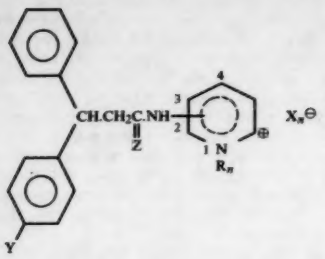
Division of Ser. No. 153,784, May 27, 1980, abandoned. This application May 7, 1981, Ser. No. 261,296

Claims priority, application Italy, May 30, 1979, 23122 A/79; Mar. 4, 1980, 20338 A/80

Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 5 Claims

1. A method of treating spastic syndromes in the muscular tissues of mammals comprising administering to the mammal a unitary dosage of from about 20 to 100 mg per kilogram of body weight of a compound having the formula:



wherein the diphenylpropylamino group is bound at position 2 or 3 of the pyridine ring; R is selected from the group consisting of hydrogen, a lower linear or branched alkyl group having from 1 to 4 carbon atoms and arakyl; X is selected from chlorine, bromine and iodine, Y is selected from hydrogen, fluorine, bromine, chlorine and methoxy; Z is Oxygen or H_2 and n is zero or 1, provided that Z is H_2 when n is one.

4,405,628

4-PYRIDYLIMIDAZOLONES AND METHOD OF USE

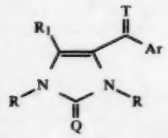
Richard C. Dage; Frank P. Palopoli; Richard A. Schnettler, all of Cincinnati, Ohio, and J. Martin Grisar, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 240,889, Mar. 5, 1981, abandoned. This application Oct. 23, 1981, Ser. No. 314,312

Int. Cl.³ A61K *31/415;* C07D *401/06*

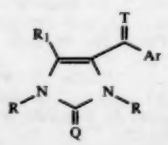
U.S. Cl. 424—263 20 Claims

1. A compound of the formula



wherein Q and T are each an oxygen; R is hydrogen, lower alkyl, lower alkanoyl or benzoyl; R_1 is hydrogen or lower alkyl; Ar is 4-pyridyl optionally substituted with lower alkyl, halogen, lower alkoxy or lower alkylthio; and the pharmaceutically acceptable acid base addition salts thereof.

11. A method of treating cardiac failure in a patient in need thereof which comprises administering to said patient a cardiotonically effective amount of a compound of the formula



wherein Q and T are each an oxygen atom; R is hydrogen, lower alkyl, lower alkanoyl, or benzoyl; R_1 is hydrogen or lower alkyl; Ar is 4-pyridyl optionally substituted with lower alkyl, halogen, lower alkoxy or lower alkylthio; and the pharmaceutically acceptable acid base addition salts thereof.

4,405,629

PROCESS FOR INCREASING GLYCINE LEVELS IN THE BRAIN AND SPINAL CORD

Richard J. Wurtman, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 36,925, May 7, 1979, abandoned. This application May 2, 1980, Ser. No. 145,644

Int. Cl.³ A61K *31/195, 31/445*

U.S. Cl. 424—267 4 Claims

1. The process for increasing the amount of glycine in the brain and spinal cord of a patient undergoing haloperidol therapy and suffering from a natural or unduced deficiency of glycine in the brain or spinal cord which comprises administering to said patient an effective amount of a neutral amino acid composition comprising L-threonine, a prcursor of L-threine or mixtures thereof.

4,405,630

ARTHROPOD REPELLENT COMPOSITIONS AND METHODS

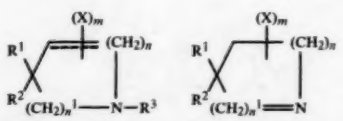
Joel Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 220,560, Dec. 29, 1980, which is a continuation-in-part of Ser. No. 29,491, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 839,156, Oct. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,932, Dec. 17, 1976, abandoned. This application Jul. 15, 1982, Ser. No. 398,532

Int. Cl.³ A01N *43/40;* C07D *221/20*

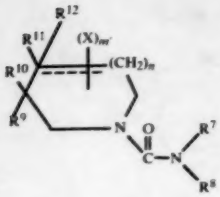
U.S. Cl. 424—267 26 Claims

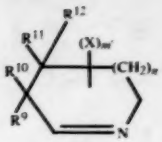
1. A method for repelling arthropods which comprises applyiing an effective repellent amount of a compound selected from:



wherein R^1 and R^2, taken together with the carbon atoms to which they are attached, form cyclopentyl, cyclohexyl, cyclononyl, cyclodecyl, cyclohexylene, cycloheptylene, cyclononylene, bicyclo-(2.2.1)-heptyl, or tetrahydropyranio; and R^3 is a radical of the formula: $—C(=Y)NR^4R^5$) wherein R^4 is hydrogen, lower alkyl of from 1 to 5 carbon atoms, lower alkenyl of from 2 to 6 carbon atoms, and R^5 is lower alkyl of from 1 to 5 carbon atoms, lower alkenyl of from 2 to 6 carbon atoms, lower alkoxy lower alkyl, carbo lower alkoxy, phenyl or substituted phenyl wherein the substituents are lower alkyl, halo or lower alkoxy or R^4 and R^5 may be joined to form, together with the nitrogen atom to which they are attached, pyrrolidinyl, piperidyl or homopiperidyl which may be substituted with a lower alkyl, carbalkoxy or ethylenedioxy; Y is O or S; X is lower alkyl of from 1 to 5 carbon atoms, lower alkoxy of from 1 to 5 carbon atoms, lower alkoxycarbonyl lower alkyl or cyano; m is an integer of 0 to 2; and n and n′ are integers each having a value of 1 to 2; and the dotted line indicates provision for a carbon to carbon double bond.

2. The method according to claim 1 wherein the repellent comprises a compound selected from one having the formula:





wherein R^7 is hydrogen; R^8 is lower alkyl of from 1 to 5 carbon atoms or R^7 and R^8 taken together with the nitrogen atom to which they are attached may be joined to form pyrrolidinyl or piperidynyl; X^1 is hydrogen, lower alkyl of from 1 to 5 carbon atoms or lower alkoxy carbonyl; R^9, R^{10}, R^{11} and R^{12} are hydrogen or R^9 or R^{11} and R^{12}, taken together with the carbon atom to which they are attached are joined to form cyclopentyl, cyclohexyl, cyclononyl, cyclodecyl, cyclohexylene, cycloheptylene, cyclononylene, bicyclo-(2.2.1)-heptyl, or tetrahydropyranio; m' is an integer of from 0 to 2, n is an integer of 1 to 3 and the dotted line represents an optional carbon to carbon double bond.

4,405,631

SPIRO[2H-1,4-BENZODIOXEPIN-3(5H)4'-PIPERIDINE AND -3'PYRROLIDINE] COMPOUNDS AND THEIR USE AS ANTIHYPERTENSIVE AGENTS

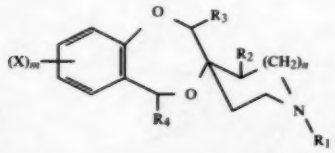
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Aug. 20, 1982, Ser. No. 410,155

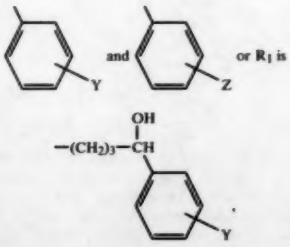
Int. Cl.[3] **C07D** *491/113;* **A61K** *31/455*

U.S. Cl. 424—267 **55 Claims**

1. A compound of the formula



wherein R_1 is a C_3 or C_4 branched or straight chain alkyl or alkenyl group or a C_4-alkynyl group terminally substituted by one or two substituents independently selected from the group consisting of



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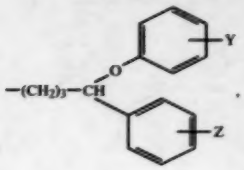
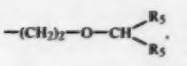
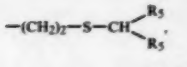
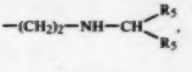
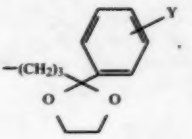
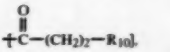


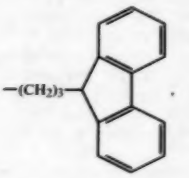


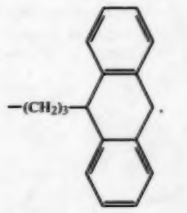








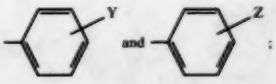




where

Y and Z are the same or different and are independently selected from the group consisting of H, Cl, F, Br, I, $—NO_2$, $—CF_3$, C_1 to C_4 straight chain alkyl, alkoxy containing C_1 to C_4 straight chain alkyl, acyl or $—NH_2$;

each R_5 substituent is independently selected from the group consisting of



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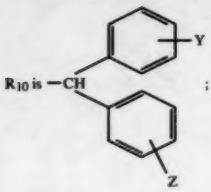
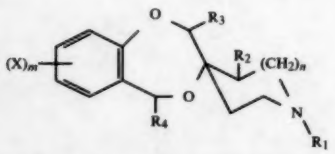


R_2 is hydrogen when n=0 or R_2 is hydrogen or a C_1 to C_3 straight chain alkyl group when n=1;
R_3 is hydrogen or a C_1 to C_3 straight chain alkyl group;
R_4 is hydrogen or a C_1 to C_3 straight chain alkyl group;
m is zero, 1 or 2;
X is Cl, F, Br, I, $-NO_2$, $-CF_3$, $-NR_6R_7$,

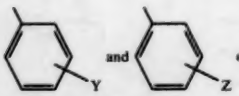
C_1 to C_6 branched or straight chain alkyl, —CN, —O—R_6, $-SR_7$, $-SO_3R_7$,

—NHCOR_8, $-SO_2R_9$ or —SOR_9 where
R_6 is hydrogen or a C_1 to C_6 straight chain alkyl group,
R_7 is hydrogen or a C_1 to C_6 straight chain alkyl group,
R_8 is a C_1 to C_6 branched or straight chain alkyl group,
R_9 is a C_1 to C_6 straight chain alkyl group;
provided that when m=2, the X-substituents can be the same only when X is selected from the group consisting of Cl, F, Br, I, C_1 to C_6 branched or straight chain alkyl or —O—R_6;
n is zero or 1;
and the pharmaceutically acceptable salts and optical and geometric isomers thereof.

28. A method for reducing hypertension in a mammal by administering to a mammal, in an amount sufficient to reduce blood pressure in the mammal, a compound of the formula



wherein R_1 is a C_3 or C_4 branched or straght chain alkyl or alkenyl group or a C_4-alkynyl group terminally substituted by one or two substituents independently selected from the group consisting of



where
Y and Z are the same or different and are independently selected from the group consisting of H, Cl, F, Br, I, $-NO_2$, $-CF_3$, C_1 to C_4 straight chain alkyl, alkoxy containing C_1 to C_4 straight chain alkyl, acyl or $-NH_2$;
each R_5 substituent is independently selected from the group consisting of

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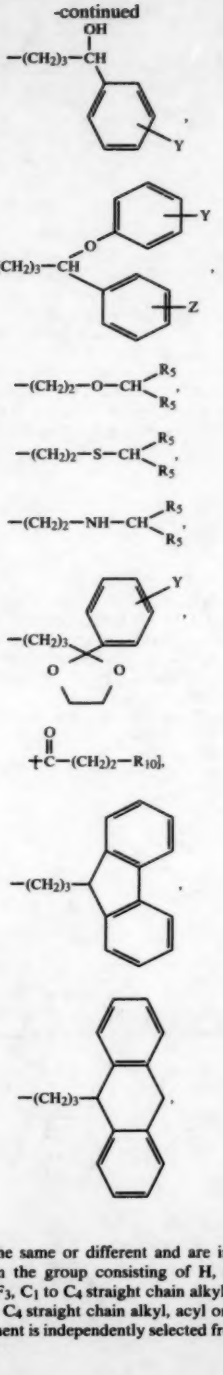
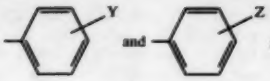
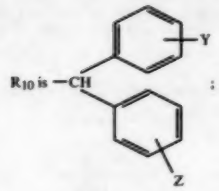
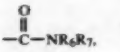


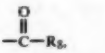




R_2 is hydrogen when n=0 or R_2 is hydrogen or a C_1 to C_3 straight chan alkyl group when n=1;
R_3 is hydrogen or a C_1 to C_3 straight chain alkyl group;
R_4 is hydrogen or a C_1 to C_3 straight chain alkyl group;
m is zero, 1 or 2;
X is Cl, F, Br, I, $-NO_2$, $-CF_3$, $-NR_6R_7$,



C_1 to C_6 branched or straight chain alkyl, —CN, —O—R_6, $-SR_7$, $-SO_3R_7$,



$-NHCOR_8$, $-SO_2R_9$ or $-SOR_9$ where
R_6 is hydrogen or a C_1 to C_6 straight chain alkyl group,
R_7 is hydrogen or a C_1 to C_6 straight chain alkyl group,
R_8 is a C_1 to C_6 branched or straight chain alkyl group,
R_9 is a C_1 to C_6 straight chain alkyl group;
provided that when m=2, the X-substituents can be the same only when X is selected from the group consisting of Cl, F, Br, I, C_1 to C_6 branched or straight chain alkyl or —O—R_6;
n is zero or 1;
and the pharmaceutically acceptable salts and optical and geometric isomers thereof.

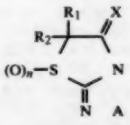
4,405,632

NOVEL DERIVATIVES OF BICYCLIC 2-IMINOTHIAZOLIDINE OXIMES

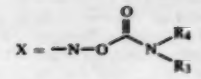
Dean F. Bushey, and Themistocles D. J. D'Silva, both of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1980, Ser. No. 163,496
Int. Cl.[3] **A61K** *31/41*; **C07D** *491/00, 487/00, 241/36*
U.S. Cl. 424—270 **27 Claims**

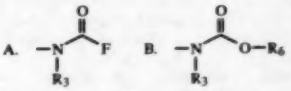
1. Compounds of the formula:



wherein
R_1 and R_2 are the same or different and are individually hydrogen, C_1–C_6 alkyl or halogen;
n=0, 1 or 2;



including E and Z isomers;
A is an acyclic, cyclic, or bicyclic alkylene or alkenylene group, or an ortho-substituted phenylene group which forms an unsaturated five membered heterocyclic ring which can also have nitrogen, or carbonyl in addition to the two nitrogens, said alkylene, alkenylene, or phenylene ring systems being optionally substituted with one or two C_1–C_4 alkyl, cyclohexyl, alkoxy, phenoxy, alkylthio, halogen, amido, alkylamido, nitrile or nitro groups;
R_3 and R_4 may be the same or different and are individually hydrogen, C_1–C_4 alkyl or C_1–C_4 alkanoyl which can be substituted with one or two halogens and in the case when R_3 is alkyl R_4 can also be $-(S)_y-R_5$ wherein:
y=1 or 2;
R_5=(a) C_1–C_{18} alkyl, C_3–C_8 cycloalkyl or perhaloalkyl;
(b) dialkyl amino or pyrrolidino group each of which may be unsubstituted or substituted with one or two alkyl groups; or
(c) a phenyl group which may be unsubstituted or substituted with one or two alkyl, chloro, fluoro, cyano, nitro, alkoxy, trifluoromethyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxyalkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, or dialkylamino: or
(d) a group of the formula:



wherein:
R_6 is
(1) C_1–C_{12} alkyl, alkoxyalkyl, or a phenylalkyl group; or
(2) a phenyl group which may be unsubstituted or substituted with one or two C_1–C_{12} alkyl, chloro, fluoro, alkoxy, alkylthio, alkylthioalkyl, alkylsulfinyl, alkylsulfinylalkyl, alkylsulfonyl, alkylsulfonylalkyl, alkynyloxy, dialkylamino, alkoxyimino, formamidino, cyano, dioxolanyl, or dithiolanyl groups in any combination; or
(3) a naphthyl, tetrahydronaphthyl, dihydrobenzofuranyl, benzodioxolanyl, or benzothienyl group all of which may be unsubstituted or substituted with one or two alkyl groups; or
(4) a group of the formula

wherein:
R_7 is chloro, alkyl, alkoxy, alkylthio, cyanoalkylthio, amidoalkylthio or cyano group; or R_7 is hydrogen provided R_8 is not hydrogen;
R_8 is an alkyl, alkylthio, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylthioalkyl, cyanoalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkoxyalkyl, nitroalkyl, hydroxyalkyl, haloalkyl, or phenyl group; said phenyl group may contain one or two alkyl, chloro, or fluoro groups in any combination; or R_8 is hydrogen provided R_7 is not hydrogen;
with the proviso that when R_6 is a phenyl group substituted with an alkyl group, no single alkyl or alkylene moiety in any R_5, R_6, R_7, or R_8 group can include more than eight carbon atoms except where indicated.

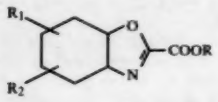
4,405,633

METHOD OF TREATMENT OF ASTHMA

Richard E. Brown, East Hanover, N.J.; Bernard Loev, Scarsdale, and Vassil St. Georgiev, Rochester, both of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,307
Int. Cl.³ A61K 31/42
U.S. Cl. 424—272 4 Claims

1. A prophylactic method for treating an asthmatic patient comprising administering to said patient an effective dose of benzoxarole-2-carboxylic acid or ester having the formula



or pharmaceutically acceptable salts thereof, wherein

R_1 and R_2 are independently H, halo, C_1–C_7 alkyl, C_3–C_7 alkoxy, C_3–C_7 cycloalkyl, hydroxy, cyano, carboxy, C_1–C_7 carboalkoxy, nitro, trifluoromethyl or R_1 and R_2 together form a methylenedioxy group; and

R is H, C_1–C_{12} alkyl or C_3–C_{12} cycloalkyl.

4,405,634

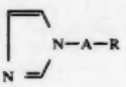
IMIDAZOLE DERIVATIVES FOR TREATING MYOCARDIAL INFARCTION

Peter B. Thorogood, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 67,379, Aug. 17, 1979, which is a continuation-in-part of Ser. No. 952,796, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,731

Claims priority, application United Kingdom, Oct. 19, 1977, 7743532; Feb. 1, 1978, 7803983; Feb. 1, 1978, 7803984; Aug. 8, 1978, 7832536; Aug. 22, 1978, 7834089; Nov. 27, 1979, 7946157
Int. Cl.³ A61K 31/415
U.S. Cl. 424—273 R 4 Claims

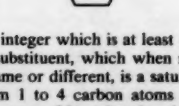
1. A method of treatment or prophylaxis of myocardial infarction in a mammal which comprises administering to the mammal an effective myocardial infarction treatment or prophylaxis amount of a compound of the formula (I)



(I)

in which

A is selected from the group consisting of straight or branched, saturated acyclic hydrocarbon radicals of 1, 2 or 3 carbon atoms, and straight or branched, unsaturated acyclic hydrocarbon radicals of 2 or 3 carbon atoms, and



wherein n is an integer which is at least 1, and

the or each Q substituent, which when n is greater than 1 may be the same or different, is a saturated hydrocarbon group of from 1 to 4 carbon atoms or an unsaturated hydrocarbon group of from 2 to 4 carbon atoms, with the provisos that

(a) when A is a methylene or ethylidene group, n is at least 2 when each Q is a saturated hydrocarbon group;

(b) when A is a branched propylene, or straight propylidene group, n is at least 3 when each Q is a saturated hydrocarbon group; and

(c) when the group A is unsaturated Q may also be selected from alkoxy of from 1 to 4 carbon atoms; alkylenedioxy of from 1 to 4 carbon atoms when n is at least 2; halo; trihalomethyl; hydroxy; carboxyl; a salt of such a carboxyl group; carboalkoxy; —NR^6R^7 or —$CONR^6R^7$, in which R^6 and R^7 may be the same or different and are hydrogen or alkyl of from 1 to 4 carbon atoms, with the further proviso that when n is 1, Q is not a saturated hydrocarbon group;

or a pharmaceutically acceptable acid addition salt thereof.

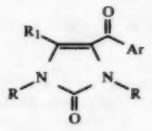
4,405,635

4-AROYLIMIDAZOL-2-ONES AND THEIR USE AS PHARMACEUTICALS

Richard A. Schnettler; Richard C. Dage, both of Cincinnati, Ohio, and Johann M. Grisar, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 373,457, Apr. 30, 1982, abandoned, which is a continuation of Ser. No. 235,453, Feb. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 159,048, Jun. 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 119,207, Feb. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 49,808, Jun. 18, 1979, abandoned. This application Sep. 13, 1982, Ser. No. 417,805
Int. Cl.³ A61K 31/415; C07D 233/70
U.S. Cl. 424—273 R 16 Claims

13. A method for the treatment of cardiac failure in a patient in need thereof which comprises administering to said patient a cardiotonically effective amount of a compound of the formula



wherein Ar is 2-furyl, 2-thienyl, phenyl, phenyl monosubstituted at the ortho, meta or para position with X_1, or disubstituted phenyl substituted at the para position with X_2 and at the ortho or meta position with X_3; X_1 is halogen, hydroxy, a straight or branched chain lower alkyl of from 1 to 4 carbon atoms, a straight or branched chain lower alkoxy of from 1 to 4 carbon atoms, a straight or branched chain lower alkylthio of from 1 to 4 carbon atoms, a straight or branched chain lower alkylsulfoxide of from 1 to 4 carbon atoms, or a straight or branched chain lower alkylsulfone of from 1 to 4 carbon atoms, trifluoromethyl, —$SO_2N(R_2)_2$, NR_3R_4, pyrrolidino, piperidino, morpholino, piperazino or N'-alkyl-piperazino; X_2 and X_3 are halogen, hydroxy, a straight or branched chain lower alkyl of from 1 to 4 carbon atoms, a straight or branched chain lower alkoxy of from 1 to 4 carbon atoms, or when X_3 is at the meta position, X_2 and X_3 together may be methylenedioxy optionally substituted by one or two methyl groups; R is hydrogen, a straight or branched chain lower alkyl of from 1 to 4 carbon atoms, a straight or branched chain lower alkylcarbonyl of from 1 to 4 carbon atoms, or a benzoyl; each of R_1, R_2, R_3 and R_4 are hydrogen or a straight or branched chain lower alkyl of from 1 to 4 carbon atoms; or a pharmaceutically acceptable salt thereof.

16. A method of claim 13 wherein R is hydrogen, R_1 is a methyl group, and Ar is a 4-(methylthio)-phenyl group, that is the compound, 1,3-dihydro-4-methyl-5-[4-(methylthio)benzoyl]-2H-imidazol-2-one or a pharmaceutically acceptable salt thereof.

4,405,636

N-(1-ALLYL-2-PYRROLIDINYL-METHYL)2-METHOXY-4-AMINO-5-METHYLSUFAMOYL BENZAMIDE, ITS METHOD OF PREPARATION AND ITS USE AS A MEDICAMENT

Jacques Perrot, and Michel Thominet, both of Paris, France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France, Paris, France

Filed Aug. 25, 1981, Ser. No. 296,164
Claims priority, application France, Aug. 28, 1980, 80 18635
Int. Cl.³ A61K *31/40*
U.S. Cl. 424—274 2 Claims

1. Method for treating patients subject to migraines which comprises administering to said patients N-(1-allyl-2-pyrrolidinyl-methyl) 2-methoxy-4-amino-5-methylsulfamoyl benzamide, quaternary ammonium salts thereof, N-oxides thereof, optical isomers thereof and its pharmacologically acceptable acid addition salts.

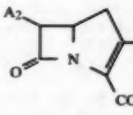
4,405,637

β-LACTAM ANTIBACTERIAL AGENTS

Kay H. Dickinson nee Berryman, Reading; Terence C. Smale, Epsom Downs, and Robert Southgate, Warnham, all of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 887,844, Mar. 17, 1978, abandoned. This application Sep. 28, 1981, Ser. No. 306,535
Claims priority, application United Kingdom, Mar. 19, 1977, 11747/77
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 62 Claims

1. A compound of the formula (II):



(II)

wherein R_1 is a group such that CO_2R_1 is a pharmaceutically acceptable ester group; A_1 is hydrogen; and A_2 is a group $CR_2R_3R_4$ wherein R_2 is hydrogen or hydroxyl; R_3 is hydrogen or lower alkyl; and R_4 is CHX wherein X is oxygen or CR_6R_7 wherein R_6 is hydrogen, lower alkyl, phenyl, CN, COR_8 or CO_2R_8 wherein R_8 is lower alkyl, phenyl or benzyl and R_7 is hydrogen or lower alkyl or R_7 is joined to R_6 to form part of a carbocyclic ring of 5 to 7 carbon atoms or R_4 is $CH{=}CHCO_2R_9$, $CH{=}CHCOR_9$ or $CH{=}CHR_{10}$ wherein R_9 is methyl, ethyl or benzyl and R_{10} is hydrogen, methyl, ethyl or benzyl.

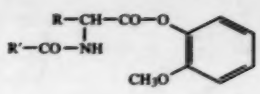
4,405,638

2-METHOXYPHENYL ESTERS OF N-SUBSTITUTED AMINO ACIDS, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Claudio Cavazza; Massimo Carloni, and Maria T. Ramacci, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A, Rome, Italy

Filed Apr. 29, 1982, Ser. No. 372,985
Claims priority, application Italy, May 11, 1981, 21620 A/81; May 15, 1981, 48485 A/81
Int. Cl.³ A61K *31/38, 31/22;* C07C *69/00;* C07D *333/16*
U.S. Cl. 424—275 16 Claims

1. 2-methoxyphenyl esters of formula I

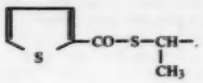


(I)

in which:

R is hydrogen, $-CH_3$ or $-CH_2SR''$, wherein R'' represents hydrogen, $-COCH_3$ or $-CH_2COOH$;

R' is $-CH_3$ or



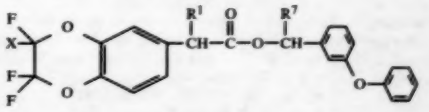
4,405,639

COMBATING ARTHROPODS WITH FLUORINE-CONTAINING PHENYLACETIC ACID ESTERS

Rainer Fuchs, Wuppertal; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath; Wilhelm Stendel, Wuppertal; Reinhard Lantzsch, and Albrecht Marhold, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 226,289, Jan. 19, 1981, Pat. No. 4,348,323, which is a division of Ser. No. 64,253, Aug. 6, 1979, Pat. No. 4,284,643. This application May 3, 1982, Ser. No. 374,370
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837524; Oct. 14, 1978, 2844816
Int. Cl.³ A01N *43/32;* C07D *319/20*
U.S. Cl. 424—278 5 Claims

1. A compound of the formula



in which

R^1 is ethyl, n-propyl, iso-propyl, iso-propenyl or cyclopropyl,

X is hydrogen or fluorine, and

R^7 is hydrogen, cyano or ethynyl.

5. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

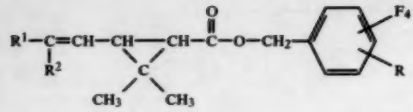
4,405,640

SUBSTITUTED FLUOROBENZYL CYCLOPROPANE CARBOXYLATES USEFUL AS INSECTICIDES

Nazim Punja, Crowthorne, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 1, 1980, Ser. No. 211,943
Claims priority, application United Kingdom, Dec. 21, 1979, 7944151
Int. Cl.³ A01N *53/00;* C07C *69/743*
U.S. Cl. 424—305 8 Claims

1. A compound of formula:



where one of R^1 and R^2 is halo and the other is trifluoron.ethyl, and R is alkyl of up to four carbon atoms, alkenyl of from three to five carbon atoms, methoxy, ethoxy, allyloxy, ethylthio or ethanesulphonyl, benzyl, dimethylamino, ethylamino, acetamido or n-methylacetamido, and R is in the 4-position with respect to the cyclopropane ester group.

4. An insecticidal composition comprising an insecticidally effective amount of a compound according to claim 1 in association with an agriculturally and horticulturally acceptable diluent.

4,405,641

CONSISTENCY REGULATOR FOR COSMETIC AND PHARMACEUTICAL PREPARATIONS

Karl Seibert, Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jul. 6, 1981, Ser. No. 280,037
Claims priority, application Fed. Rep. of Germany, Jul., 1980, 3026071
Int. Cl.³ A01N *37/08;* A61K *47/00*
U.S. Cl. 424—305 7 Claims

1. A cosmetic or pharmaceutical preparation comprising an effective amount of a pharmaceutically active material or a cosmetically useful material and an effective amount of a consistency regulator comprising a monocarboxylic-2-hydroxy-alkylester or mixture thereof made by reacting under esterification conditions one or more monocarboxylic acids containing at least twelve carbons atoms with one or more 1,2-alkylene oxides containing from about 8 to about 40 carbon atoms.

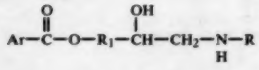
4,405,642

METHOD FOR TREATMENT OR PROPHYLAXIS OF CARDIAC DISORDERS

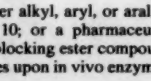
Sheung-tsam Kam, Vernon Hills; Paul W. Erhardt; Robert J. Borgman, both of Mundelein, all of Ill., and John P. O'Donnell, Morgantown, W. Va., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 28, 1980, Ser. No. 211,341
Int. Cl.³ A61K *31/24;* C07C *101/48*
U.S. Cl. 424—309 29 Claims

1. A method for the treatment or prophylaxis of cardiac disorders in a mammal, comprising administering by intravenous infusion into a mammal having a critical cardiac illness a -blocking ester compound of the formula



wherein R is lower alkyl, lower alkenyl, or aralkyl; R_1 is lower alkylene; and Ar is phenyl or naphthyl optionally substituted with lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halogen, acetamido, amino, nitro, alkylamino, hydroxy, hydroxyalkyl, cyano, or a group of the formula:



wherein R_2 is lower alkyl, aryl, or aralkyl and n is an integer from 0 to about 10; or a pharmaceutically acceptable salt thereof; which β-blocking ester compound rapidly converts to inactive metabolites upon in vivo enzymatic cleavage; wherein said β-blocking ester compound is intravenously infused at a rate sufficient to establish an effective β-blockade in said mammal, and said infusion is then terminated to effect substantial recovery of said mammal from the β-blocking effects of said compound within about one hour.

4,405,643

TREATMENT OF ACUTE PULMONARY EDEMA WITH ARGININE ESTERS

Giancarlo Sportoletti, and Alessandro Baglioni, both of Milan, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

Division of Ser. No. 162,008, Jun. 23, 1980, Pat. No. 4,308,280.
This application Aug. 27, 1981, Ser. No. 296,830
Claims priority, application Italy, Dec. 28, 1979, 28416 A/79
Int. Cl.³ A61K *31/22*
U.S. Cl. 424—311 1 Claim

1. A method of protecting an animal from pulmonary edema caused by adrenaline which consists of administering parenterally to said animal the ethyl or methyl ester of L-arginine as the hydrochloride salt in an aqueous solution at a pH between 5.5 and 8.5 in an amount effective to protect said animal from edema.

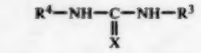
4,405,644

MEDICAMENTS FOR THE TREATMENT OF DISORDERS OF LIPOMETABOLISM AND THEIR USE

Hans-Joachim Kabbe, Leverkusen; Erich Klauke, Odenthal; Hans P. Krause, Wuppertal; Mithat Mardin, Wuppertal, and Rüdiger Sitt, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 164,387, Jun. 30, 1980, abandoned.
This application Dec. 17, 1981, Ser. No. 331,712
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928485
Int. Cl.³ A61K *31/275, 31/17*
U.S. Cl. 424—322 9 Claims

1. A method of combating lipometabolic illnesses in warm-blooded animals which comprises administering to the animals a hypolipidemically effective amount of a urea derivative of the formula



in which

R^3 and R^4 are identical or different and in each case represent a mono-or bi-cyclic carbocyclic aryl radical, optionally substituted by 1 or 2 identical or different substituents selected from cyano, halogen, alkyl, alkoxy and alkylmercapto, the alkyl, alkoxy and alkylmercapto radicals mentioned being in turn substituted by 1 or more fluorine atoms with the proviso that (a) R^3 and R^4 contain a total of 2 or 3 substituents including a total of 1 or 2 halogen substituents (b) R^3 and R^4 are devoid of ortho substituents and (c) R^3 and R^4 are so chosen that p,p'-substituted compounds and m,m'-disubstituted compounds in which the substituents are fluorinated alkyl groups are excluded, and X represents an oxygen or sulphur atom either alone or in admixture with an inert carrier or in the form of a medicament.

4,405,645

TREATMENT OF DANDRUFF WITH BIGUANIDES

Rudi Röthlisberger, Fribourg, and Friedrich Noser, Bonnefontaine, both of Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

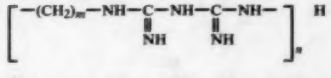
Filed Mar. 26, 1981, Ser. No. 249,666

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012767

Int. Cl.³ A61K *7/06, 31/155*

U.S. Cl. 424—326 5 Claims

1. A method for the treatment of dandruff, comprising applying to the scalp of an individual requiring such treatment an effective amount of a pharmaceutically acceptable lotion, cream, gel or shampoo containing as an active ingredient, from about 1.0% by weight to about 5.0% by weight of a compound represented by the formula



wherein m is from 1 to 10 and n is from 1 to 6 or the hydrochloride thereof.

4,405,646

USE OF CYCLIC CARBONATE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS AND CHEWING GUMS

Richard M. Boden, Monmouth Beach, and Michael Licciardello, Farmingdale, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

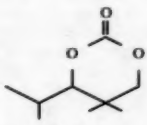
Division of Ser. No. 329,212, Dec. 10, 1981, abandoned. This application Jul. 8, 1982, Ser. No. 396,260

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—3 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of adding to said foodstuff base or chewing gum base from 0.10 parts per million up to about 50 parts per million by weight based on total composition of a cyclic carbonate having the structure:



4,405,647

METHOD OF COMPACTING CHEWING GUM BASE

E. Eugene Fisher, Elgin; R. Ray Estes, Downers Grove, both of Ill.; Orrin D. Lokken, and Elmer G. Paguette, both of Madison, Wis., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jun. 15, 1981, Ser. No. 273,361

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—4 17 Claims

1. A method of compacting chewing gum base comprising the steps of:

providing a fluidized bed consisting of a powdered solid turbulently suspended within a gaseous medium, the weight ratio of said powdered solid to said gum base being at least two to one;

comminuting said gum base into particles within said bed, said powdered solid serving to coat said particles to prevent cohesion therebetween;

periodically classifying said coated particles to identify sizes thereof suitable for tableting; and

tableting said identified particles to form a compact body.

4,405,648

METHOD FOR PRODUCING BREAD

Shin-Ichi Atsumi, Kawagoe; Masayuki Sasaki, Tsurugashima, and Ikuo Kitamura, Kamifukuoka, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Obi, Japan

Continuation of Ser. No. 70,322, Aug. 24, 1979, abandoned. This application Feb. 13, 1981, Ser. No. 235,160

Int. Cl.³ A21D *2/06, 2/22*

U.S. Cl. 426—19 2 Claims

1. A method for producing bread comprising the steps of (1) kneading a dough containing wheat flour with an additive mixture consisting of a L-ascorbic acid; a reducing agent selected from the group consisting of cysteine, glucose-cysteine, glutathione, thioctic acid and their salts, keratin hydrolysates containing cysteine, powdered yeast, germs of grains which contain glutathione, alkaline metal sulfites, alkali metal hydrosulfites and alkali metal metabisulfites; and a thickener selected from the group consisting of xanthan gum, carrageenan, tamarind seed gum, guar gum, locust bean gum, furcellaran, gum Arabic, alginic acid, ghatti gum, tragacanth gum, karaya gum, powdered yams, carboxymethyl starch and pullulan, wherein the L-ascorbic acid is added in the amount of 2 to 100 ppm of weight of the wheat flour, the reducing agent is added in the amount of 0.02 to 1.0 microgram equivalent of its reducing functional group per gram of wheat flour and the thickener is added in the amount of 10 to 3000 ppm of the weight of the wheat flour, (2) allowing the kneaded dough to ferment, and (3) baking the fermented dough.

4,405,649

PROCESS FOR PRODUCING PREMIUM QUALITY FISH MEAL FROM WHOLE FISH

George A. Jeffreys; James F. Tobey, Jr., and Jean L. Price, all of Salem, Va., assignors to Marvin Dudley, Beaumont, Tex.

Continuation of Ser. No. 36,293, May 7, 1979, abandoned, which is a continuation of Ser. No. 853,532, Nov. 21, 1977, abandoned. This application Sep. 9, 1980, Ser. No. 185,429

Int. Cl.³ C12K *1/00*

U.S. Cl. 426—59 1 Claim

1. A continuous process for producing a liquefied intermediate for protein fish meal comprising mixing and mashing comminuted whole fish with water and a proteolytic protein liquefying enzyme used at pH parameter of 4.5–8.0 and a temperature parameter of 30°–87° C. forming an aqueous mixture, vigorously agitating the lower portion of the aqueous mixture to reduce the mixture to flesh and bone particles and concurrently agitating the upper portion of said mixture at a relatively slow rate to maintain the lighter particles in suspension while the heavier particles sink to said lower portion and further compartmentalizing said aqueous mixture into multiple closed compartments while agitating and liquefying said comminuted fish at progressively increasing and controlled temperatures in each of said closed compartments.

4,405,650

COMPRESSED YEAST PRODUCT AND PROCESS

Paul F. Spadafora, Lagrangeville, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 27, 1981, Ser. No. 286,723

Int. Cl.³ A23J *1/18, 3/00*

U.S. Cl. 426—62 14 Claims

1. A process for preparing compressed yeast, which comprises:

contacting a first stage yeast suspension with a sufficient amount of an osmotically-active material to withdraw water from the interior of individual yeast cells, maintaining contact for a period of time effective to withdraw water and soluble solids which interfere with filtration

from the interior of individual yeast cells, dispersing the first stage yeast suspension in additional water, removing a portion of the water containing dissolved osmotically-active material and soluble solids freed from the yeast cells during contact to prepare a second stage yeast suspension; then contacting the second stage yeast suspension with an osmotically-active material at a concentration lower than that employed to contact the first stage suspension but sufficient to withdraw water from the interior of individual yeast cells; and then filtering the yeast.

4,405,651

PROCESS FOR CONTINUOUSLY SEPARATING FAT FROM BUTTER

Jacques Entremont, Veyrier du Lac, and Raymond Levardon, Paris, both of France, assignors to Entremont S.A., Annecy, France

Filed Apr. 13, 1981, Ser. No. 253,348

Claims priority, application France, Apr. 29, 1980, 80 10117; Jan. 21, 1981, 81 01073

Int. Cl.³ A23C *15/14*

U.S. Cl. 426—241 **5 Claims**

1. A process for the separation of fat from butter comprising the steps of:

(a) forming a layer of molten butter;

(b) irradiating said molten butter with microwaves to such an extent that the increase in temperature of the molten butter due to said microwave irradiation does not exceed about 6° Celsius;

(c) said layer of molten butter during said irradiation being in a condition of rest or laminar flow and having a thickness less than the depth of penetration of said microwaves; and

(d) allowing the fat to separate from the molten butter after said microwave irradiation by settling of water and protein from the butter.

4,405,652

PREPARATION OF WINE HAVING A LOW CALORIE CONTENT AND A REDUCED ALCOHOL CONTENT

Armand R. Boucher, Stamford, Conn., assignor to Joseph E. Seagram & Sons, Inc., New York, N.Y.

Filed Jan. 21, 1982, Ser. No. 341,363

Int. Cl.³ C12G *1/00, 3/08, 3/12*

U.S. Cl. 426—494 **16 Claims**

1. A continuous method of directly substantially reducing the alcohol content of the entire original wine to produce a low calorie wine having a substantial amount of its original alcohol content comprising:

feeding an original wine product from a source through an inlet line to a centrifugal film evaporator having an air tight chamber;

pulling a vacuum in the chamber;

forming a thin film of the original wine product by centrifugation within the chamber;

utilizing indirect heat exchange with the thin film while it is subject to centrifugation;

exposing the thin film for a relatively short period of time to elevated temperatures and the vacuum in the chamber while it is subjected to centrifugation to remove alcohol as a vaporized product from the original wine product leaving a reduced alcohol wine;

feeding the reduced alcohol wine under the influence of centrifugal force from the evaporator and then into a receiving tank to obtain said low calorie wine;

passing the vaporized product through a condensor; and

collecting the vaporized product as a high proof by-product.

4,405,653

DEHYDRATED FISH CONCENTRATE AND PROCESS FOR SAME

Robert D. Gray, 6 Clarendon St., Gloucester, Mass. 01930

Continuation-in-part of Ser. No. 135,733, Mar. 31, 1980, abandoned. This application Jul. 29, 1981, Ser. No. 287,858

Int. Cl.³ A22C *25/00;* A23B *4/04*

U.S. Cl. 426—643 **5 Claims**

1. A process for production under non-foaming conditions of a dehydrated sea food product which consists essentially of dehydrating in one step, in a mechanically agitated evaporator minced raw sea food products in the absence of any other added ingredients under reduced pressure no higher than 30 inches of mercury, in the absence of an oxidizing atmosphere, and at a temperature of up to 95° C., whereby solid masses of the sea food product are unable to form and whereby there is produced a dry, dehydrated product, which, when rehydrated, possesses the fibrous texture, odor and flavor of the original sea food product.

4,405,654

4'-HALO-SUBSTITUTED SUCROSE DERIVATIVES

Cheang K. Lee, Singapore, Singapore, assignor to Tate & Lyle Public Limited Company, England

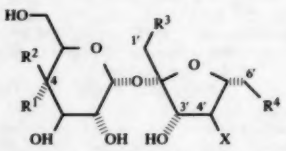
Continuation-in-part of Ser. No. 315,479, Oct. 27, 1981, abandoned. This application Apr. 26, 1982, Ser. No. 371,995

Claims priority, application United Kingdom, Oct. 28, 1980, 8034666; Aug. 21, 1981, 8125621

Int. Cl.³ A23G *3/30;* A23L *1/236;* A61K *7/16;* C07H *5/02*

U.S. Cl. 426—658 **12 Claims**

1. A compound of the formula (I)



(I)

wherein

X represents a halogen atom;

R^1 and R^2 respectively represent a combination selected from the group consisting of: a hydroxy group and a hydrogen atom; a halogen atom and a hydrogen atom; and a hydrogen atom and a halogen atom; and

R^3 and R^4 independently represent a substituent selected from the group consisting of a halogen atom and a hydroxy group;

at least one of R^1, R^2 and R^3 representing a halogen atom.

4,405,655

METHOD AND ARRANGEMENT FOR INTERNALLY COATING A TUBE BY REACTIVE DEPOSITION FROM A GAS MIXTURE ACTIVATED BY A PLASMA

Hermanus N. Tuin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,093

Claims priority, application Netherlands, May 1, 1981, 8102149

Int. Cl.³ B05D *7/22*

U.S. Cl. 427—38 **6 Claims**

1. A method of internally coating a tube consisting of an electrically insulating material, said method comprising the steps of:

passing a reactive gas mixture through the tube;

forming flames contacting the outside of the tube at two longitudinally-spaced sites;

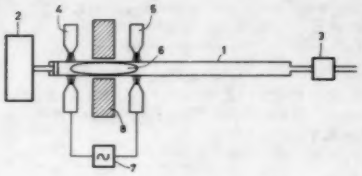
reciprocally moving the flame sites along the tube; and

forming a plasma in the tube by high-frequency electric

energy capacitively coupled to the gas mixture by means of the two flames.

3. An apparatus for internally coating a tube consisting of an electrically insulating material, said apparatus comprising:

means for supplying a reactive gas mixture to the inside of the tube;



two burners which, in operation, produce flames which contact the tube at longitudinally spaces sites;

a high-frequency generator, electrically connected to the burners, for producing a plasma in the gas mixture in the tube; and

means for reciprocally moving the burners along the tube.

4,405,656

PROCESS FOR PRODUCING PHOTOCONDUCTIVE MEMBER

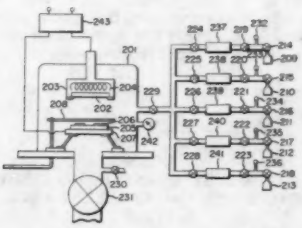
Isamu Shimizu, Yokohama; Kyosuke Ogawa, and Eiichi Inoue, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,484

Claims priority, application Japan, Oct. 16, 1980, 55-144797

Int. Cl.³ H01L *45/00*

U.S. Cl. 427—39 **13 Claims**



1. A process for producing photoconductive members which comprises:

(a) evacuating a pressure-reducible deposition chamber to reduce the pressure;

(b) introducing silicon hydride compound gas, halogen-containing silicon compound gas, and diluent gas in a volume flow ratio of 4–30:2–60:36–81, respectively, into said deposition chamber;

(c) forming a gas plasmic atmosphere by generating glow discharge in said surrounding gas mixture;

(d) thereby forming, on the surface of a support, for producing the photoconductive member, which has been arranged previously in said deposition chamber, a photoconductive layer constructed of an amorphous material comprising silicon atoms as matrix.

4,405,657

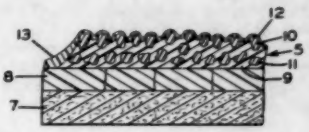
NON-SKID PLASTIC FLOORING PRODUCT AND METHOD OF MANUFACTURE

Jesse D. Miller, Jr., and James R. Petzold, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 237,666, Feb. 24, 1981, Pat. No. 4,348,447. This application Mar. 1, 1982, Ser. No. 353,195

Int. Cl.³ B32B *5/16, 5/26*

U.S. Cl. 427—54.1 **3 Claims**



1. A method of manufacturing a non-skid decorative plastic floor covering comprising:

(a) providing a plastic base as a liquid matrix;

(b) applying elements in a preselected pattern to the base, said elements being of a depth and breadth such that when elements are applied to the base and embedded therein, there is curable base material in an amount sufficient to bind together the elements embedded in the base material in substantially abutting relationship but in an amount insufficient to cover the uppermost layer of elements allowing these elements to protrude from the base material;

(c) said elements are rounded inorganic quartz particles and have a Moh hardness greater than about 4 and a particle size distribution such that none are greater than about 715 microns, about 80% are between about 300 and 595 microns and none are smaller than 150 microns;

(d) embedding said particles throughout the base material in a substantially abutting relationship with the uppermost layer of particles protruding from the base material;

(e) curing the base material;

(f) applying an overall clear or translucent curable wear coating to form a continuous film over the cured base material having the protruding particles in an amount such that a rough skid-resistant texture is imparted to the coating by the underlying protruding particles; and

(g) curing the wear layer.

4,405,658

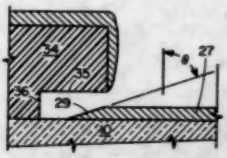
METHOD OF PRODUCING POSITIVE SLOPE STEP CHANGES ON VACUUM DEPOSITED LAYERS

Peter L. Young, North Wales, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,577

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—63 **6 Claims**



1. A method of producing positive slope step changes between layers of material being deposited in a vacuum chamber on a wafer being processed, comprising:

applying a lift-off photoresist overhang pattern to the layer

of the wafer to be processed to define the overhang areas of said layer on which material shall be deposited,

placing said wafer in a vacuum chamber,

reducing the pressure in said vacuum chamber to a pressure sufficiently low to remove harmful traces of oxygen, water vapor and carbon monoxide,

introducing an inert gas into said vacuum chamber to provide an inert gas environment therein,

stabilizing said inert gas environment pressure at a high predetermined value of 1×10^{-4} to 5×10^{-2} torr,

evaporating and depositing a layer of atoms of material over said lift-off pattern and onto said areas of said layer on which material shall be deposited,

maintaining said inert gas environment pressure at said high predetermined value to cause the atoms of said material to be directly deposited and to disperse under said overhang of said photoresist areas and form positive slope step changes in excess of twenty degrees, and

removing said lift-off photoresist overhang pattern leaving said deposited material with positive slope step changes at the edges.

4,405,659

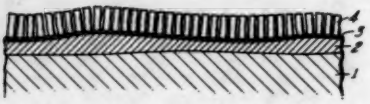
METHOD FOR PRODUCING COLUMNAR GRAIN CERAMIC THERMAL BARRIER COATINGS

Thomas E. Strangman, Phoenix, Ariz., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 109,956, Jan. 7, 1980, Pat. No. 4,321,311. This application Dec. 4, 1981, Ser. No. 327,305

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—248.1 **9 Claims**



1. A method for producing a metallic article having a durable ceramic thermal barrier coating thereon, said method consisting essentially of:

a. providing a superalloy substrate with a clean surface

b. applying a thin adherent layer of MCrAlY to the clean surface

c. developing a thin uniform adherent alumina layer on the MCrAlY layer

d. applying a columnar ceramic coating to the alumina layer by vapor deposition.

4,405,660

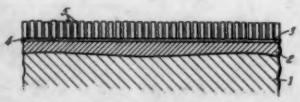
METHOD FOR PRODUCING METALLIC ARTICLES HAVING DURABLE CERAMIC THERMAL BARRIER COATINGS

Nicholas E. Ulion, Marlborough, and Duane L. Ruckle, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 109,955, Jan. 7, 1980, Pat. No. 4,321,310. This application Dec. 4, 1981, Ser. No. 327,376

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—248.1 **13 Claims**



1. A method for producing a metallic article having a durable ceramic thermal barrier coating thereon, said method consisting essentially of:

a. providing a superalloy substrate with a clean surface;

b. applying a thin adherent layer of MCrAlY to the clean surface;

c. polishing the MCrAlY layer;

d. developing a thin uniform adherent alumina layer on the polished MCrAlY layer;

e. applying a columnar grained ceramic coating to the alumina layer by vapor deposition.

4,405,661

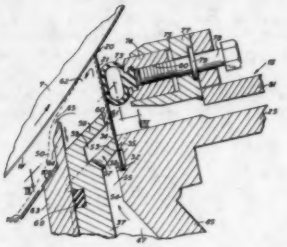
BLADE TYPE FOUNTAIN COATER AND METHOD

Robert J. Alheid, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 10, 1981, Ser. No. 301,111

Int. Cl.³ B05D *3/12;* **B05C** *5/02*

U.S. Cl. 427—356 **20 Claims**



19. A method of coating a web travelling continuously on backing surface means and including supplying the coating material from delivering means to a coating nip provided by an upper edge of an upwardly projecting doctor blade in coating nip relation across the width of said web, and controlling flow of the coating material from said delivering means to said coating nip and including subjecting the coating material to a plurality of successive pressure drops so that the coating material reaches said coating nip uniformly throughout the extent of said blade edge, the improvement comprising:

effecting the final pressure drop through a slit orifice formed in part by a surface of said doctor blade and the orifice being located in spaced relation below said coating nip; and

directing the coating material substantially rectilinearly upwardly across said blade surface to said nip.

4,405,662

THERMOSETTING RESINOUS BINDER COMPOSITIONS AND THEIR USE AS COATING MATERIALS

Werner T. Raudenbusch; Adrianus J. M. Barnhoorn; Petrus G. Kooijmans; Willem L. Sederel; Adrianus M. C. Van Steenis, and Theresia F. M. Schets, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 24, 1982, Ser. No. 423,407

Claims priority, application United Kingdom, Nov. 5, 1981, 8133385

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—386 **8 Claims**

1. A thermosetting resinous binder composition, heat-curable in combination with a transesterification-promoting metal compound as a catalyst to provide an insoluble infusible coating, comprising a mixture of:

(1) a non-acidic resinous compound essentially free of ethylenical unsaturation, having a molecular weight of at least 900 and a hydroxyl content of at least 0.2 equivalent per 100 g, and

(2) as cross-linking agent a non-acidic polyester of a polycarboxylic acid having more than one beta-hydroxyl ester group per molecule, at least one of components (1) and (2) having a hydroxyl or beta-hydroxyl ester functionality, respectively, of more than 2,

characterized in that the beta-hydroxyl ester group is substituted in the gamma-position by a hydroxyl, amino and/or transferable ester group derived from a polycarboxylic acid.

4,405,663

TIN PLATING BATH COMPOSITION AND PROCESS

Edmund W. Kinkelaar, Strongsville, and Paul Golar, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 29, 1982, Ser. No. 363,069
Int. Cl.³ B05D *1/28*
U.S. Cl. 427—428 **10 Claims**

1. An aqueous immersion plating bath for plating tin over zinc coated steel, said bath comprising:

(a) stannous ion in an amount ranging from 50 to 100 grams per liter of water;

(b) sulfuric acid in an amount ranging from 20 to 100 grams per liter of water;

(c) nonylphenoxy-poly(ethyleneoxy)ethanol having a molecular weight of from about 740 to 1600 in an amount ranging from 1.5 to 3.0 grams per liter of water; and

(d) Guar gum resin in an amount ranging from 1.5 to 11.5 grams per liter of water.

8. A method of immersion plating tin over zinc coated steel web on a continuous basis by roll coating application comprising the steps of:

(a) continuously running the coated steel web through a tin plating bath having the following composition:

1. about 65 to 85 grams of stannous ion per liter of water;
2. sulfuric acid in an amount of 40 to 80 grams per liter of water;
3. nonylphenoxy-poly(ethyleneoxy)ethanol in an amount of about 1.5 grams per liter and having an average molecular weight of from about 800 to about 1540; and,
4. Guar gum resin in amount of about 7.5 grams per liter of water;

(b) applying a wet film to said web in a thickness ranging from about 3.0 to 4.0 mils;

(c) contacting the strip with the bath for about 10 to 20 seconds; and,

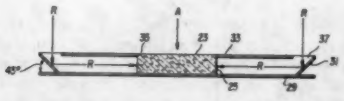
(d) operating said bath at a temperature of approximately 24° C.

4,405,664

EXHIBIT OF A DECORATIVE ART WORK

Lisa M. Talbert, 355 Folkstone Way, York, Pa. 17402

Division of Ser. No. 263,255, May 13, 1981. This application Dec. 28, 1981, Ser. No. 334,600
Int. Cl.³ A47G *1/12*
U.S. Cl. 428—14 **5 Claims**



1. A device for exhibiting a light transparent art work comprising:

(a) a pair of spaced substantially opaque planar members for enclosing the art work therebetween;

(b) one of the planar members including an aperture through which the art work may be viewed from a direction substantially perpendicular to such planar member;

(c) reflective means disposed around peripheral edges of the planar members for reflecting and directing light inwardly through the art work and towards opposed portions of the reflective means; and

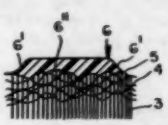
(d) whereby light and color patterns generated by the art work and the reflective means are viewable from a direction substantially perpendicular to the one planar member.

4,405,665

GROUND COVERING WITH DRAINAGE-PROMOTING MEMBERS

Michel Beaussier, Balan; Henry Lesch, and Emile Evon, both of Mouzon, all of France, assignors to Societe Internationale de Revetements de sol S.A. - S.I.R.S., Neuilly-Sur-Seine, France

Filed Apr. 21, 1982, Ser. No. 370,396
Claims priority, application France, Jul. 28, 1981, 81 15063
Int. Cl.³ A01N *3/00*; B32B *33/00*
U.S. Cl. 428—17 **9 Claims**



1. A water-permeable artificial turf ground covering, comprising:

a water-permeable wear layer formed with:

a grass-like array of nonputrescible synthetic resin pile tufts

a water-permeable nonwoven or woven synthetic resin support thermally bonded to said tufts at lower ends thereof, and

a nonwoven layer composed of polyester or glass fibers reinforcing said support and located therebelow; and

an array of drainage-promoting members formed on an underside of said nonwoven layer opposite said elements, said members being disposed discontinuously along said underside of said layer and being composed of synthetic resin material and having the form of truncated pyramids with substantially rectangular bases.

4,405,666

FILM LAMINATE FOOD WRAP AND FOOD POUCH THEREFROM

Joann H. Squier, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,747
Int. Cl.³ B32B *27/08*
U.S. Cl. 428—35 **17 Claims**

1. A flexible film laminate comprising:

(a) an oriented polyacrylonitrile film containing an adhesion promoting proportion of a liquid heterized ethylene oxide-propylene oxide copolymer prepared by reacting said oxides with at least one monohydric alcohol active hydrogen compound initiator having from about 1 to about 10 aliphatic carbon atoms;

(b) an adhesive layer contacting said polyacrylonitrile film, said adhesive layer being a combination of (1) a styrene-butadiene block copolymer having a monomer parts by weight ratio of from about 1:3 to about 3:1 and (2) a random terpolymer of from about 30 to about 40 parts by weight of 1,3-pentadiene; about 30 to about 40 parts by weight of a monocyclic terpene and from about 25 to about 35 parts by weight of alpha methylstyrene, said combination

consisting essentially of from 1 to about 3 parts by weight of the block copolymer to from about 3 to about 1 part by weight of the terpolymer; and

(c) a second oriented polyacrylonitrile film or a heat-sealable polyolefin film contacting said adhesive layer.

14. A process for laminating two or more polyacrylonitrile

films or a polyacrylonitrile film and a heat-sealable polyolefin film comprising:

(a) incorporating into said polyacrylonitrile film an adhesion promoting proportion of a liquid heterized ehtylene oxide-propylene oxide copolymer prepared by reacting said oxides with at least one monohydroxy alcohol active hydrogen compound initiator having from 1 to about 10 atoms;

(b) interposing between said films a layer of an adhesive composition comprising a combination of (1) a styrene-butadiene block copolymer having a monomer parts by weight ratio of from about 1:3 to about 3:1 and (2) a random terpolymer of from about 30 to about 40 parts by weight of 1,3-pentadiene, about 30 to about 40 parts by weight of a monocyclic terpene; and from about 25 to about 35 parts by weight of alpha methylstyrene, said combination consisting essentially of from about 1 to about 3 parts by weight of the block copolymer to from about 3 to about 1 part by weight of the terpolymer; and

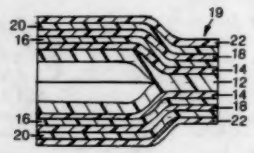
(c) applying presure or pressure and heat to the film surfaces.

4,405,667

RETORTABLE PACKAGING STRUCTURE

Ronald C. Christensen, Oshkosh; Roger P. Genske; Dennis E. Kester, both of Neenah, and William F. Ossian, Appleton, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Aug. 6, 1982, Ser. No. 405,716
Int. Cl.³ B65D *85/72, 65/40, 81/18*
U.S. Cl. 428—35 **9 Claims**



1. A multiple layer flexible packaging structure, wherein the layers are firmly adhered to each other in face to face contact, the structure comprising, in order:

(a) a first layer of linear low density polyethylene;

(b) a second layer of a blend of 20% to 80% linear low density polyethylene and 80% to 20% propylene ethylene copolymer;

(c) optionally, one or more of third, fourth and fifth layers of propylene ethylene copolymer;

(d) a sixth layer of anhydride modified polypropylene;

(e) a seventh layer of nylon;

(f) an eighth layer of ethylene vinyl alcohol copolymer; and

(g) a ninth layer of nylon.

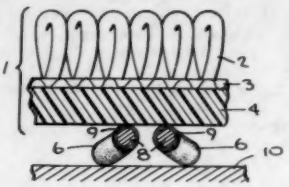
4,405,668

ONE PIECE BINDER-CARPET CONSTRUCTION

William Wald, Greenville, S.C., assignor to Lewis J. McDermott, III, Cartersville, Ga.

Continuation of Ser. No. 298,095, Aug. 31, 1981, which is a continuation of Ser. No. 112,952, Jan. 17, 1980, abandoned. This application Dec. 10, 1982, Ser. No. 448,478
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—40 **10 Claims**

1. A combined cover-binder unit for strippable attachment to a rigid holding surface comprising a cover portion, said cover portion having an upper face and a lower face, said lower face including a backing layer, a binder portion beneath the lower face of the cover portion, said binder portion comprising a binder material having an upper surface and a lower surface, and comprising a plurality of spaced frame elements which intersect each other to form a grid-like construction, the entire surfaces of said spaced frame elements of the said binder material being coated with an adhesive coating, the entire upper surface of the binder material being substantially permanently adhered to the entire lower face of the cover portion by said adhesive, the space between said spaced frame elements being devoid of adhesive so that the areas of the lower face of the cover portion not adhered to said binder portion are exposed areas, the adhesive on said lower surface of the binder material being of the pressure-sensitive type, the lower surface of the binder material being adapted to be removably adhered



to a rigid holding surface by said pressure-sensitive adhesive, the entire binder material extending over the entire area of the lower face of said cover portion, and the exposed areas of said lower face of said cover portion between said spaced frame elements being devoid of adhesive whereby they are not adhered to said rigid holding surface, said cover portion comprising a carpet having a pile and a backing layer permanently attached therebeneath and wherein the binder material is permanently embedded and adhered to the underside of said backing layer.

4,405,669

LAMINATE REINFORCEMENT FOR FIBRE-REINFORCED SYNTHETIC RESINS

Richard Pott, Lage, Fed. Rep. of Germany, assignor to Koninklijke Textielfabrieken Nijverdal-Ten Cate N.V., Almelo, Netherlands

Filed Sep. 8, 1981, Ser. No. 300,109
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—61 **9 Claims**

1. A laminate reinforcement in a fibre-reinforced synthetic resin, characterized in that the laminate reinforcement is obtained by means of at least two parallel tissue tapes forming by their tissue seams (**14**) a paunch gap (**15**), which is covered with a similar, but narrower covering tape (**16**) to provide doubling of the reinforcing fibres in the area of the paunch gap in parallel relationship producing a Stringer effect, in which the warp and weft yarns of the tissue tape are made from reinforcing fibres such as carbon, aramid, boron and like fibres having a higher elasticity modulus and a higher specific tensile strength than glass fibres, the warp yarns of carbon (**11**) and aramid (**12**) being closely spaced with one another and the weft yarns (**13**) being spaced apart in parallel relationship by a larger distance than the warp yarns (**11**) and (**12**).

4,405,670

CAPACITANCE ELECTRONIC DISC STAMPER HAVING IMPROVED STAIN RESISTANCE AND METHOD FOR THE MANUFACTURE THEREOF

Mohamed E. Labib, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 383,264
Int. Cl.³ B32B 3/00; C23C 15/00
U.S. Cl. 428—64 2 Claims

1. An improved stamper for molding a capacitive electronic disc, said stamper being formed of nickel and having an information containing track defined in the molding surface thereof, said molding surface having formed thereon a continuous conformal layer of nickel oxide which is free, to substantially free, of microdefects and which is about 10 to 40 angstroms in thickness.

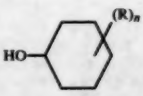
4,405,671

OPTICAL INFORMATION RECORDING DISK

Hiroshi Ozawa; Masaaki Shin; Akio Fuziwara; Mitsuyoshi Nakamura; Ichiro Otsuka, and Kazuo Sugazaki, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,010
Claims priority, application Japan, May 11, 1981, 56-69352
Int. Cl.³ B32B 3/02
U.S. Cl. 428—65 11 Claims

1. An optical information recording disk comprising as a base material thereof a polymer or copolymer having a glass transition temperature of at least 50° C., a melt index determined in accordance with ASTM-D1238 at 230° C. and under a 3800 g load condition in the range of from 1 to 50, and having from 10 to 100% by weight of a structural unit derived from a monomer (A) based on the total amount of said polymer or copolymer, said monomer (A) being an ester of an α,β-unsaturated carboxylic acid and an alicyclic alcohol represented by the general formula:



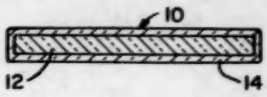
wherein n is an integer of 1–5, R denotes a hydrogen or an alkyl or alkenyl group, and, when n stands for an integer of 2–5, the Rs may be the same or different.

4,405,672

COMPOSITE PHOTOCHROMIC GLASS ARTICLE AND METHOD OF MAKING

Roger J. Araujo, Horseheads; Nicholas F. Borrelli, Elmira; Paul A. Tick, and Donald M. Trotter, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,351
Int. Cl.³ B32B 1/04, 17/06
U.S. Cl. 428—68 12 Claims



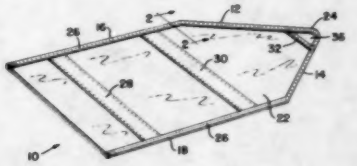
1. A composite photochromic glass article comprising a core portion and a thin surface layer substantially encasing that core portion, one of said core portion and encasing layer being composed of a first glass containing a copper-cadmium halide photochromic phase in a surface layer thereof, and the other of said component parts being composed of a second glass that has a copper-cadmium-silver halide photochromic phase developed therein, the depth of photochromic development in the article being not over about ten mils and exhibiting, in the darkened state, a color intermediate the characteristic red and green of the component glasses.

4,405,673

SKID PAD FOR MOVING HEAVY ITEMS

Kenneth P. Fridley, 1537 E. Vine, West Covina, Calif. 91791, and Robert E. Fridley, 5132 Hedda St., Lakewood, Calif. 90712

Filed Oct. 26, 1981, Ser. No. 314,885
Int. Cl.³ B32B 1/04, 3/10; A47B 91/00
U.S. Cl. 428—80 6 Claims



1. A skid pad apparatus which comprises:

an elongated generally planar flexible member having first and second side edges and a forward edge, the side edges converging forwardly; and

a reinforcing strip extending along said first and second side edges and extending beyond said forward edge to define an opening intermediate said reinforcing strip and said flexible member and to define a handle continuous with the reinforcing strip for maneuvering heavy loads positioned on the skid pad.

4,405,674

PROCESS FOR MAKING A MAGNETIC MATERIAL CONTAINING CARPET TILE AND CARPET TILE

Joseph H. Kyle, LaGrange, Ga., assignor to Carpets International-Georgia (Sales), Inc., LaGrange, Ga.

Continuation of Ser. No. 259,566, May 1, 1981, abandoned. This application Aug. 16, 1982, Ser. No. 408,597
Int. Cl.³ B32B 3/02
U.S. Cl. 428—96 9 Claims

1. A process for manufacturing a magnetic material containing carpet tile comprising:

forming by high shear dispersal a uniform fluid plastisol mixture of a liquid resinous material comprising a polymer of a vinyl or vinylidene chloride, a wetting agent and at least about 60 percent by weight of the mixture of a particulate magnetizable material;

applying the said uniform fluid mixture to the back of a carpet facing to form a carpet composite;

heating the said carpet composite to solidify the mixture and fuse the mixture with the carpet facing and thereby provide a carpet covering;

cutting the resulting magnetized carpet covering into carpet tiles; and

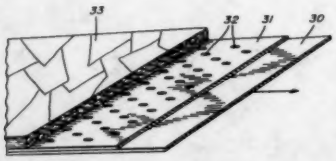
applying a magnetic force to the carpet tiles to magnetize the particulate magnetizable material.

4,405,675

PANELBOARD WITH FRICTION SURFACE

Jan A. H. Dessens, Saskatchewan, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed May 17, 1982, Ser. No. 379,258
Int. Cl.³ B29J 5/00
U.S. Cl. 428—156 7 Claims



1. A process for producing a waferboard panel having at least one friction surface, comprising the steps of assembling wood wafers coated with an adhesive binder into a mat with a plate, the plate having a surface adjacent the mat with a plurality of indentations or holes therein in a predetermined pattern, and pressing the mat in a press at a high temperature with the plate adjacent the mat to form the wafers into a waferboard panel such that the friction surface of the waferboard panel has a plurality of raised protrusions spaced apart in a predetermined pattern.

4,405,676

DECORATIVE RIBBON OR SHEET MATERIAL

Daniel P. Pohl, Grant, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 13, 1981, Ser. No. 263,048
Int. Cl.³ B32B 3/00
U.S. Cl. 428—164 9 Claims

1. A decorative sheet material comprising:

(a) a plastic film embossed over substantially its entire top surface in a first pattern and over substantially its entire bottom surface in a second pattern, said first pattern being a substantially regular parallel convex cylindrical lens configuration wherein the radius of curvature of the convex cylindrical lens is about one-half the thickness of said plastic film, and said second pattern being of a type which is capable of diffusing light;

(b) a first color coat adhered to said bottom surface of said plastic film;

(c) a reflective coat adhered to the underside of said first color coat, said reflective coat comprising a metallic powder dispersed in an organic resin binder; and

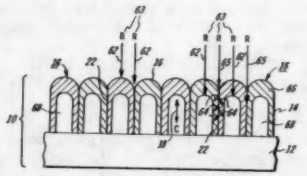
(d) a second color coat adhered to the underside of said reflective coat.

4,405,677

POST TREATMENT OF PERPENDICULAR MAGNETIC RECORDING MEDIA

Tu Chen, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1981, Ser. No. 306,125
Int. Cl.³ H01F 10/02; C23C 15/00
U.S. Cl. 428—172 9 Claims



1. A method of post treatment to a continuous thin film magnetic medium comprising a substrate upon which is deposited a thin magnetic layer comprising acicular shaped crystalline magnetic particles with the crystallographic "c" axis of the crystal in each particle oriented parallel to the longitudinal axis of the particle acicula and the longitudinal axis of the acicular particles oriented substantially normal to the plane of said magnetic layer, said post treatment effectively increasing the separation between magnetic particles and thereby increasing their coercivity while decreasing their demagnetization field of the film, said method comprising the step of utilizing enhanced grain boundary reaction at the interganular boundary of said particles to achieve particle separation effectively either by diffusing the magnetic layer with a reagent or etching the magnetic layer with an etching agent.

4,405,678

PROTECTED VAPOR-DEPOSITED METAL LAYERS

Edward J. Downing, and Richard S. Fisch, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 22, 1982, Ser. No. 350,437
Int. Cl.³ B05D 1/36; B32B 15/08
U.S. Cl. 428—215 17 Claims

1. An article comprising a substrate having on at least one surface thereof a vapor deposited metal layer and adhered to said metal layer a layer of 1 to 600 nm comprising an organic material having a vapor pressure at 20° C. less than or equal to that of 1-n-octanol and having (a) a carbonyl group which is not part of a carboxyl group, (b) a phenoxy group, (c) an ester group, or (d) an alcohol group.

4,405,679

COATED SHAPED ARTICLE OF POLYCARBONATE TYPE RESIN

Akira Fujioka, Osaka; Kazuo Sakiyama, Ibaraki; Akio Takigawa, and Motoaki Yoshida, both of Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co. Ltd. and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed Jan. 5, 1981, Ser. No. 222,577
Claims priority, application Japan, Jan. 10, 1980, 55-1531
Int. Cl.³ B32B 27/30, 27/36
U.S. Cl. 428—216 18 Claims

1. A coated shaped article of a polycarbonate type resin possessed of improved abrasion resistance, which comprises:

(I) a shaped substrate of a polycarbonate type resin,

(II) an undercoat layer formed on said substrate in a thickness of at least about 0.1 micron, which undercoat is formed of a composition containing a polymer selected from the group consisting of:

(i) a polymer having repeating structural units represented by the general formula (3):

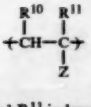
(3)

wherein, R^6 and R^7 independently stand for a hydrogen atom or an alkyl group of 1 to 5 carbon atoms or carboxyl group and X for a side chain containing carboxyl group, amino group or epoxy group, and

(ii) a polymer having repeating structural units represented by the general formula (4):

(4)

wherein, R^8 and R^9 indepedently stand for a hydrogen atom or a lower alkyl group of 1 to 5 carbon atoms or carboxyl group and Y for a side chain containing a hydroxyl group and repeating structural units represented by the general formula (5):

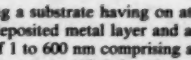


(5)

wherein, R^{10} and R^{11} independently stand for a hydrogen atom or a lower alkyl group or carboxyl group and Z for a side chain containing a carboxyl group, alkoxycarbonyl group, amino group, substituted amino group, epoxy group or tetrahydro-furyl group, and

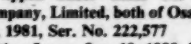
(III) an overcoat layer applied to and cured on said undercoat layer in a thickness of at least about 1 micron, which overcoat is formed of a composition containing: as component (A)

at least one hydrolyzate selected from the group of epoxy group-containing silicon compounds represented by the general formula (1):



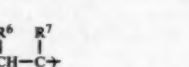
(1)

wherein, R^1 stands for an organic group containing an epoxy group, R^2 for a hydrogen atom, a hydrocarbon group of 1 to 6 carbon atoms, or vinyl group, R^3 for a hydrocarbon group of 1 to 5 carbon atoms, an alkoxyalkyl group or an acyl group of 1 to 4 carbon atoms, a for an integer of 1 to 3 and b for an interger of 0 to 2, providing that $a+b \leqq 3$ is satisfied; as component (B) at least one member selected from the group consisting of hydrolyzates of organic silicon compounds represented by the general formula (2):

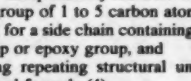


(2)

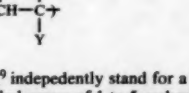
wherein, R^4 stands for a hydrocarbon group of 1 to 6 carbon atoms, vinyl group, methacryloxy group, amino group, mercapto group or organic group containing fluorine or chlorine, R^5 for a hydrocarbon group of 1 to 5 carbon atoms, an alkoxy-alkyl group or acyl group of 1 to 4 carbon atoms, and c for an integer of 0 to 3, and b for an interger of 0 to 3, colloidal silica and organic titanium compounds; and as component (C) a curing catalyst, wherein component (A) is used in an amount of 100 parts by weight (of solids, calculated as



and component (B) is used in an amount falling within the range of from 1 to 567 parts by weight (of solids, calculated as



in the case of an organic silicon compound of the general formula (2), as SiO_2 in the case of colloidal silica, or as



in the case of an organic titanium compound, wherein R^{12} stands for an unhydrolyzed group containing no hydroxyl group and d for an integer of 1 to 4), said undercoating being of a thickness which promotes adhesion of the overcoating and said overcoating being of a thickness which gives satisfactory abrasion resistance and adhesion without cracking.

4,405,680

ROOFING SHINGLE

David R. Hansen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1982, Ser. No. 452,595
Int. Cl.³ B32B 15/00
U.S. Cl. 428—285 7 Claims

1. A roofing shingle having improved low temperature flexibility comprising:

(a) a flexibilized mat prepared by impregnating a fiber glass mat with a mixture of about 70 to about 94 percent by weight of an unblown bitumen having an asphaltene content (heptane insolubles) below twenty percent by weight and about 6 to about 30 percent by weight of a monoalkenyl arene-conjugated diene block copolymer; and

(b) an asphalt composition coated on at least one surface of said flexibilized mat, said asphalt composition comprising the blend of a blown bitumen and a filler, said asphalt composition having a softening point of about 100° C. to about 120°0 C.

4,405,681

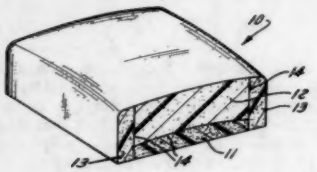
FOAM ARTICLE AND METHOD OF PREPARATION

James T. McEvoy, Oak Creek, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jan. 20, 1983, Ser. No. 459,370

Int. Cl.³ B32B *3/26, 5/14, 5/20*

U.S. Cl. 428—309.9 **7 Claims**



4. An article suitable for use as a cushion which includes a firm foam top layer, a soft foam bottom layer and a border or side wall of foam of intermediate density, said layers and side wall being bonded and knitted together along their common boundaries without the use of adhesives.

4,405,682

METHOD FOR PRODUCING FIRE-RESISTANT, THERMALLY INSULATING BOARD

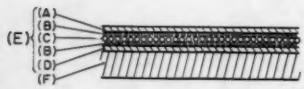
Shoichi Fujita, Minoo; Katsuhisa Kodama, Nishinomiya, and Kiyohiro Yuge, Yawata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 13, 1981, Ser. No. 243,452

Claims priority, application Japan, Mar. 19, 1980, 55-35194

Int. Cl.³ B32B *5/18;* **C29K** *3/28;* **B32B** *5/30;* **B29D** *27/04*

U.S. Cl. 428—317.7 **16 Claims**



1. A method for producing a fire-resistant, thermally insulating board, which consists essentially of applying liquid hydrated sodium silicate (B) onto the inner surface of a facing material or sheet (A), spreading powdery hydrated sodium silicate (C) over the said applied surface, laying the said spread surface on

(1) a facing material or sheet (D), or

(2) a facing material or sheet (D) applied in advance with liquid hydrated sodium silicate (B) or

(3) a facing material or sheet having powdery hydrated sodium silicate (C) spread further over the applied surface of (2),

and then heating and pressing the thus-produced assembly to cure the liquid hydrated sodium silicate-powdery hydrated sodium silicate layers between the facing material (A) and the opposing facing material (D) to glue the assembly together to form a fire-resistant board (E), followed by laminating the resulting fire-resistant board (E) with a rigid isocyanurate foam (F).

4,405,683

SURFACE PLATE AND SLIDEWAY ELEMENTS

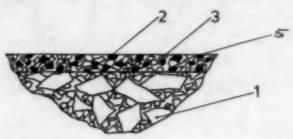
Hansjörg Renker, Hilterfingen, Switzerland, assignor to Fritz Studer AG, Glockenthal, Switzerland

Filed Mar. 5, 1981, Ser. No. 240,911

Claims priority, application Switzerland, Mar. 21, 1980, 2219/80

Int. Cl.³ B32B *5/16, 9/00*

U.S. Cl. 428—323 **1 Claim**



1. A low friction plastic-like coating on a substantially planar base of natural or artificial rock forming a hardened layer that when ground has specified low friction properties, said coating consisting essentially of a mixture of particulate solid lubricants selected from the group consisting of ultra-fine particles of graphite, poly (tetra-fluoroethylene), molybdenum disulfide, and boron nitride, a relatively hard particulate filler selected from the group consisting of aluminum oxide, silica, silicon carbide, silicon dioxide, diamond and metal carbides, and a resinous binding agent selected from the group consisting of epoxy and polyester resins, said solid lubricants comprising approximately 20 percent, by weight, of the mixture and having a particle size that ranges from 0.05 to 0.1 mm, said filler comprising approximately 50 percent, by weight, of the mixture and having a particle size from 1 μm to 1 mm, said resinous binding agent comprising approximately 20 to 50 percent, by weight, of the mixture whereby when the mixture sets and is ground, the surface formed thereby contains exposed solid lubricants.

4,405,684

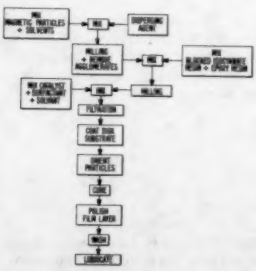
RIGID MAGNETIC COATING COMPOSITION WITH THERMOSETTING BINDER FOR HARD FILE

Bruce F. Blumentritt, and John C. Shyan Shen, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 304,445, Sep. 21, 1981, abandoned. This application Nov. 15, 1982, Ser. No. 441,469

Int. Cl.³ B32B *15/04;* **H01F** *10/02*

U.S. Cl. 428—336 **20 Claims**



1. A rigid magnetic recording medium having finely divided magnetic particles dispersed in a typical thermosetting resin

binder composition applied as a thin film, having a thickness of less than 80 micro inches, closely adhered to a rigid non-magnetic substrate wherein the coating composition includes 50 to 80 percent by weight of magnetic particles, 20 to 50 percent by weight of binder and comprises:

20 to 60 parts by weight of a blocked isocyanate having at least three reactive sites per chain;

40 to 80 parts by weight of an oligomer having at least two hydroxy reactive sites per polymer chain and a molecular weight of 200 to 800 per hydroxy site;

said oligomer consisting of one of the group of bisphenol A epoxy and any combination of bisphenol A epoxy, acrylic polyol and polyester polyol wherein each constituent is present in a concentration no greater than 97% by weight; and

additives not exceeding 30 parts by weight.

4,405,685

CARBON FIBERS WITH DUPLEX METAL CARBIDE COATING AND METHODS FOR MANUFACTURE THEREOF

Kuniaki Honjo, Ikeda, and Akio Shindo, Kawanishi, both of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 319,911

Claims priority, application Japan, Nov. 13, 1980, 55/160606; Aug. 19, 1981, 56/130515

Int. Cl.³ B32B *9/04, 33/00;* **D02G** *3/02*

U.S. Cl. 428—368 **10 Claims**

1. A uniaxially aligned carbon fiber coated with a duplex film consisting of an inner-layer film containing free carbon and metal carbide at a weight ratio in the range from 95:5 to 5:95 and an outer-layer film substantially solely of metal carbide, the total thickness of the inner-layer film and the outer-layer film being in the range of 0.01 to 3 μm, the thickness ratio of said inner-layer film to said outer-layer film falling in the range of 5:1 to 1:5.

4. A method for the manufacture of a uniaxially aligned carbon fiber coated with a duplex film which method comprises the steps of heating the carbon fiber to be coated to a temperature in the range of 800°–1800° C. in an inert atmosphere, feeding a mixed gas containing a compound containing a carbide-forming metal, a carbon containing compound, and hydrogen gas into contact with the heated carbon fiber thereby depositing on the carbon fiber (a) an inner-layer film of a mixture of free carbon and a metal carbide, and then feeding a mixed gas containing a carbon compound, a metal compound, and hydrogen into contact with the coated carbon fiber thereby depositing on said inner-layer film an outer-layer film of a metal carbide, the total thickness of said inner-layer film and said outer-layer film being in the range of 0.01 to 3 μm.

4,405,686

CRIMPABLE CONJUGATE FILAMENTARY YARNS HAVING A FLATTENED CROSS-SECTIONAL CONFIGURATION

Toshimasa Kuroda, Takatsuki; Seiji Ishii, Matsuyama, and Tatsuya Shibata, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 7, 1982, Ser. No. 385,942

Claims priority, application Japan, Jun. 5, 1981, 56-85611

Int. Cl.³ B32B *27/02;* **D02G** *3/02*

U.S. Cl. 428—374 **12 Claims**

1. A conjugate filamentary yarn, characterized in that each of the individual constituents whose cross-sectional view presents a compressed flat figure, which comprises an elastomeric thermoplastic elastomer and a non-elastomeric polyamide or a polyester, wherein the respective components are arranged in such a way as to satisfy the following formulas (I) to (III) simultaneously:

$$4 \geq \frac{b}{a} \geq 1.2 \quad \text{(I)}$$

$$2.3 \geq \frac{EA}{PA} \geq 0.43 \quad \text{(II)}$$

$$\overline{EiPi} \geq \frac{a}{2} \quad \text{(III)}$$

where a indicates the length of the minor axis which passes the centroid on the cross section of the filament; b, the length of the major axis which passes the centroid on the cross section of the filament; EA, the area occupied by the thermoplastic elastomer on the cross section of the filament; PA, the area occupied by non-elastomeric polyamide or polyester on the cross section of the filament; and EiPi, the distance between the centroid Ei of the thermoplastic elastomer component on the cross section of the filament and the centroid Pi of the non-elastomeric polyamide or polyester component.

4,405,687

POLYBOROSILOXANE COMPOSITION FOR PRODUCTION OF ELECTRICALLY INSULATING LAYER AND INSULATED ELECTRIC WIRE USING THE COMPOSITION

Minoru Morita; Etsuo Hosokawa, and Kohzoh Arahara, all of Yokohama, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Japan

Filed Apr. 9, 1982, Ser. No. 367,025

Claims priority, application Japan, Apr. 13, 1981, 56-54359; Jun. 2, 1981, 56-84667; Jun. 30, 1981, 56-102044; Jul. 17, 1981, 56-112695

Int. Cl.³ B32B *27/12;* **H01B** *3/46, 17/62*

U.S. Cl. 428—383 **6 Claims**

1. A polyborosiloxane composition for the production of an electrically insulating layer on a conductor surface, which composition comprises:

(A) a polyborosiloxane obtained by the polycondensation reaction at a temperature of 50° to 800° C. of

(1) at least one boron compound selected from the group consisting of boric acids, boric anhydride, metallic salts of boric acid, halogenated borons, and boric esters,

(2) at least one silane compound selected from the group consisting of silane compounds represented by the general formulas, SiX_4, $SiRX_3$, and $SiRR'X_2$ (wherein, R and R' each denote a methyl group or a phenyl group, and X denotes a hydroxyl group (providing that, in SiX_4, at least one of the X's is a halogen atom), or a halogen atom, providing that where X is a hydroxyl group, a dehydration condensate is embraced), and

(3) at least one silicone oil selected from the group consisting of dimethyl silicone oil and phenyl methyl silicone oil having a viscosity of at least 1.0 centistoke at 25° C.,

(B) at least one thermally resistant synthetic resin selected from the group consisting of silicone resins and synthetic resins containing a nitrogen-containing heterocyclic ring,

(C) an inorganic filler, and

(D) a common solvent for (A) the polyborosiloxane and (B) the thermally resistant synthetic resin.

5. An insulated electric wire characterized by having a thin electrically insulating layer of a polyborosiloxane composition comprising:

(A) a polyborosiloxane obtained by the polycondensation reaction at a temperature of 50° to 800° C. of

(1) at least one boron compound selected from the group

consisting of boric acids, boric anhydride, metallic salts of boric acid, halogenated borons, and boric esters,

(2) at least one silane compound selected from the group consisting of silane compounds represented by the general formulas, SiX_4, $SiRX_3$, and $SiRR'X_2$ (wherein, R and R' each denote a methyl group or a phenyl group, and X denotes a hydroxyl group (providing that, in SiX_4, at least one of the X's is a halogen atom), or a halogen atom, providing that where X is a hydroxyl group, a dehydration condensate is embraced), and

(3) at least one silicone oil selected from the group consisting of dimethyl silicone oil and phenyl methyl silicone oil having a viscosity of at least 1.0 centistoke at 25° C.,

(B) at least one thermally resistant synthetic resin selected from the group consisting of silicone resins and synthetic resins containing a nitrogen-containing heterocyclic ring, and

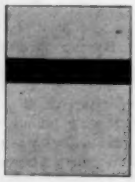
(C) an inorganic filler.

4,405,688

MICROPOROUS HOLLOW FIBER AND PROCESS AND APPARATUS FOR PREPARING SUCH FIBER

James J. Lowery, Charlotte, N.C.; Neil D. Plotkin, Scotch Plains, N.J., and Jack Robinson, Waxhaw, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,795
Int. Cl.³ D02G 3/00
U.S. Cl. 428—398 5 Claims



1. A microporous polyolefinic hollow fiber having:

(a) an average wall thickness in the range of from about one micron to about 75 microns;

(b) a coefficient of variation in wall thickness throughout a cross-section taken perpendicular to the axis of the fiber of less than about 20%;

(c) an average inner diameter in the range of from about 5 microns to about 1500 microns;

(d) a coefficient of variation in inner diameter throughout a cross-section taken perpendicular to the axis of the fiber of less than about 8%;

(e) a substantially uniform porosity across the circumference of said fiber as determined by the average ratio of the minimum pore density to the maximum pore density around the circumference of said fiber of less than about 3:1;

(f) an oxygen flux of at least 100 cc/cm²-min. at 10 p.s.i.g.; and

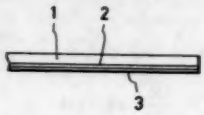
(g) an average pore size as measured by electron micrograph of from about 50 to about 2000 Angstroms in width and from 500 to 10,000 Angstroms in length.

4,405,689

ULTRAVIOLET-CURING COMPOSITION, PREPREG SHEET CONTAINING THE SAME, AND METALLIC MATERIAL HAVING ANTICORROSIVE COATING

Hideo Watanabe, Yugawaramachi, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 219,935, Dec. 24, 1980, Pat. No. 4,377,458.
This application Dec. 8, 1981, Ser. No. 328,628
Claims priority, application Japan, Dec. 26, 1979, 54-169907
Int. Cl.³ B32B 15/08
U.S. Cl. 428—467 7 Claims



1. A prepreg sheet comprising a fibrous base and a B-staged ultraviolet-curing composition containing an ultraviolet-curing resin having an active OH group or COOH group, a vinyl monomer, a thickening agent which is reactive with the active OH group or COOH group of the ultraviolet-curing resin and a photosensitizer.

4,405,690

POLYETHYLENE GLYCOL MODIFIED MELAMINE ALDEHYDE RESIN AND POSTFORMABLE LAMINATE MADE THEREWITH

Lenon G. Brooker, Hampton, and Halbert Mungin, Varnville, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 19, 1980, Ser. No. 208,591
Int. Cl.³ B32B 27/08
U.S. Cl. 428—503 5 Claims

1. A high pressure, postformed laminate, comprising postformable core stock comprising a plurality of absorbent sheets impregnated with a postformable phenol-aldehyde resin to which is bonded, at a pressure of at least about 1,000 psi., an absorbent print sheet impregnated with a resinous composition consisting essentially of the cured admixture of:

(A) melamine and aldehyde, where the mole ratio melamine:mole ratio aldehyde is from about 1:1.5 to about 1:3;

(B) about 1 weight percent to about 45 weight percent, based on weight of melamine, of water soluble polyethylene glycol having a molecular weight of from about 200 to about 1,000; and

(C) sufficient water to form a solution of about 15 percent solids to about 65 percent solids; where the polyethylene glycol, melamine, and aldehyde are reacted together in the presence of heat and water, and where the bonded high pressure laminate has a portion thereof postformed to a predetermined radius at temperatures of about 118° C. or higher.

4,405,691

TERBIUM ACTIVATED YTTRIUM GADOLINIUM OXYSULFIDE X-RAY PHOSPHOR AND SCREEN CONTAINING THE SAME

Ramon L. Yale, Ulster, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 10, 1981, Ser. No. 291,756
Int. Cl.³ C09K 11/475
U.S. Cl. 428—690 3 Claims

1. An X-ray phosphor consisting essentially of $(Y,Gd)_2O_2S:Tb$ where the ratio of yttrium to gadolinium is between about 97/3 and 91/9 exhibiting greater brightness under X-ray excitation than said phosphor absent Gd or said phosphor having a ratio of yttrium to gadolinium that is not between about 97/3 and 91/9.

4,405,692

MOISTURE-PROTECTED ALKALI HALIDE INFRARED WINDOWS

Frederick G. Yamagishi, Newbury Park, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 4, 1981, Ser. No. 327,385
Int. Cl.³ B32B 27/28, 27/06; B05D 3/06; G02B 1/10
U.S. Cl. 428—696 17 Claims

1. An infrared optical element comprising an alkali halide crystal having topologically smooth outer surfaces chemically bound to a non-infrared absorbing surfactant and overcoated with a polymerized saturated hydrocarbon film.

4,405,693

HIGH RATE METAL-SULFURYL CHLORIDE BATTERIES

Narayan Doddapaneni, Glenside, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 5, 1981, Ser. No. 308,337
Int. Cl.³ H01M 4/36
U.S. Cl. 429—101 10 Claims

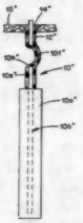
1. In an electrochemical cell having an alkali metal anode, an electrolyte salt, a sulfuryl chloride depolarizer and a cathode, the improvement comprising a dopant in said cathode, wherein said dopant is one selected from a group consisting of monomeric and polymeric phthalocyanine complexes of iron and cobalt.

4,405,694

ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, and Kathleen M. Kealey, Newburyport, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1981, Ser. No. 333,093
Int. Cl.³ H01M 6/14
U.S. Cl. 429—101 21 Claims



1. An electrochemical cell comprising;

a metal housing and a cover for said housing, said cover having a metal electrical terminal extending therethrough; and

an electrochemical system within the metal housing and including an electrolytic solution and a battery stack exposed to the electrolytic solution, said electrolytic solution including a catalytically-reducible soluble cathode, and said battery stack comprising:

a cathode structure adjacent to the metal housing and operative during discharge of the cell to catalytically reduce the soluble cathode of the electrolytic solution; and

an anode structure comprising:

a metal electrode spaced from the cathode structure and the metal housing;

a metal electrically-conductive assembly at the potential of the metal electrode and connected between the metal electrode and the electrical terminal in the cover; the metal electrically-conductive assembly comprising:

an electrically-conductive metal conductor in physical and electrical contact with the metal electrode and having a first portion disposed within the metal electrode and a second portion extending outwardly from the metal electrode; and

an electrically-conductive metal jumper element physically and electrically connected between the second portion of the metal conductor and the electrical terminal in the cover; and

a chemically-stable, anti-parasitic discharge material covering at least a portion of the metal electrically-conductive assembly and operative to prevent the catalytic reduction of the soluble cathode in the electrolytic solution at the surfaces of the portions of the metal electrically-conductive assembly covered by the anti-parasitic discharge material.

4,405,695

CELLS HAVING CATHODES DERIVED FROM ALKALI SALTS OF CHROMIUM DICHALCOGENIDES

Raphael Moshtev, Sofia, Bulgaria; Gianfranco Pistoia, Rome, Italy; Veselin Manev, and Anna Nasalevska, both of Sofia, Bulgaria, assignors to Consiglio Nazional delle Ricerche, Roma, Italy and Accademia Bulgara delle Scienze, Bulgaria, Bulgaria

Filed Jun. 12, 1981, Ser. No. 273,086
Claims priority, application Italy, Jun. 17, 1980, 48998 A/80
Int. Cl.³ H01M 10/36
U.S. Cl. 429—103 12 Claims

1. An electrochemical secondary cell comprising:

(a) an anode comprising a material selected from the group consisting of an alkali metal, an earth-alkali metal and their mixtures;

(b) a non-aqueous electrolytic solution;

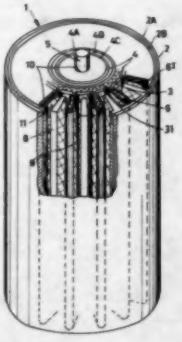
(c) a cathode comprising a alkali metal salt of chromium dichalcogenides having the general formula $M'_xM''_yCrB$, wherein M' and M'' are metals of group I A of the Periodic Table, B is a chalcogen and x and y have values between zero and one.

4,405,696

ELECTROCHEMICAL STORAGE CELL

Wilfried Fischer, Neckargemünd, and Dieter Hasenauer, Weinheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,662
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117384
Int. Cl.³ H01M 10/39
U.S. Cl. 429—104 31 Claims



1. Electrochemical storage cell based on alkali metal and chalcogen comprising at least one anode space for the alkali metal anolyte and a cathode space for the chalcogen catholyte, with the anode, space and the cathode space separated from each other by an alkali ion-conducting solid electrolyte wall, a

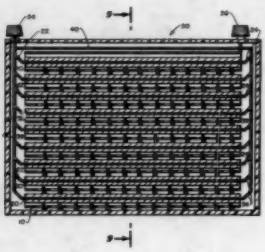
metallic housing bounding the cell, said solid electrolyte wall having a plurality of spaced, outwardly extending hollow recesses, and at least one current collector disposed between each pair of adjacent recesses.

4,405,697

LEAD-ACID BATTERY

John J. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed May 29, 1981, Ser. No. 268,484
Int. Cl.³ H01M 39/00
U.S. Cl. 429—161 15 Claims



1. A battery having positive and negative terminals comprising a sealed casing:

one or more cells received in said casing serially connected in conductive relation wherein said cells include a plurality of horizontally oriented grids of alternately stacked positive and negative monoplates forming a vertical grid stack having four sides;

two vertical positive bus bar means, each connected to opposed side edges of each said positive monoplate for conducting current to said positive terminal and providing structural support to said grid stack; and

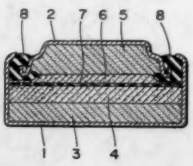
two vertical negative bus bar means, each connected to the two opposed, remaining side edges of said negative monoplates for conducting current to said negative terminal and for further structurally supporting said grid stack.

4,405,698

SILVER OXIDE CELLS

Tooru Nagaura, Koriyama, Japan, assignor to Sony Eveready Inc., Tokyo, Japan

PCT No. PCT/JP81/00081, § 371 Date Dec. 7, 1981, § 102(e) Date Dec. 7, 1981, PCT Pub. No. WO81/02950, PCT Pub. Date Oct. 15, 1981
PCT Filed Apr. 8, 1981, Ser. No. 329,351
Claims priority, application Japan, Apr. 9, 1980, 55-46584
Int. Cl.³ H01M 10/32, 10/04
U.S. Cl. 429—219 10 Claims



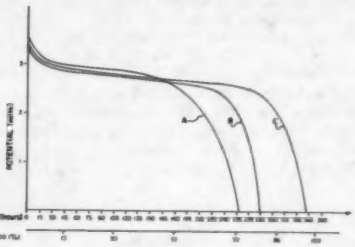
1. A silver oxide cell having a cathodic material comprising AgO, an anodic material, a separator disposed between said anodic material and said cathodic material, and an electrolyte; the improvement wherein a layer of a reaction product is disposed between and in contact with the separator and the cathodic material which layer comprises a reacted mixture of an oxide of manganese or an oxide of nickel, an electrolyte and a reducing material.

4,405,699

MANGANESE DIOXIDE ELECTRODE FOR LITHIUM BATTERIES

Franz J. Kruger, Wiesbaden, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,440
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123100
Int. Cl.³ H01M 4/02, 4/04
U.S. Cl. 429—224 6 Claims



1. A positive manganese dioxide electrode for galvanic elements with negative lithium electrode, characterized in that the active electrode material is a γ-MnO_2 produced by oxidizing tempering of α-MnO(OH).

4,405,700

ELECTRODE COATING COMPOSED OF COPOLYMERS DERIVED FROM DIACETONE ACRYLAMIDE

Guy Rampel, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 157,313, Jun. 9, 1980, which is a division of Ser. No. 966,745, Dec. 5, 1978, Pat. No. 4,245,016. This application Mar. 17, 1981, Ser. No. 244,701
The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.
Int. Cl.³ H01M 2/16
U.S. Cl. 429—248 7 Claims

1. In a battery separator, the improvement comprising a separator coating consisting essentially of a copolymer derived from diacetone acrylamide and a polymerizable monomer.

4,405,701

METHODS OF FABRICATING A PHOTOMASK

Edward L. Banks, Willingboro Township, Burlington County, N.J.; Bruce E. Truax, Durham Township, Middlesex County, Conn., and Laurence S. Watkins, Hopewell Township, Mercer County, N.J., assignors to Western Electric Co., New York, N.Y.

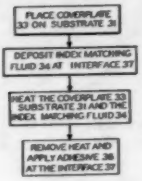
Division of Ser. No. 287,970, Jul. 29, 1981, Pat. No. 4,361,643, which is a continuation-in-part of Ser. No. 222,451, Jan. 5, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,644
Int. Cl.³ B32B 31/00; G03C 5/06; G03F 9/00
U.S. Cl. 430—5 2 Claims

1. A method of fabricating a photomask, comprising the steps of:

placing a substantially flat, light transmissive coverplate in intimate contact with a light transmissive baseplate having a metallic pattern thereon;

depositing at least one drop of, a refractive index matching fluid at the interface edge of the coverplate and baseplate,

said fluid having substantially the same refractive index as said baseplate and said coverplate; and


PLACE COVERPLATE 33 ON SUBSTRATE 31
DEPOSIT INDEX MATCHING FLUID 34 AT INTERFACE 37
HEAT THE COVERPLATE 33 SUBSTRATE 31 AND THE INDEX MATCHING FLUID 34
REMOVE HEAT AND APPLY ADHESIVE 36 AT THE INTERFACE 37

heating the baseplate, coverplate and the refractive index matching fluid to cause the fluid to flow between the patterned baseplate and the coverplate.

4,405,702

ELECTROPHOTOGRAPHIC IMAGE-FORMING MEMBER WITH LADDER-TYPE SILICON RESIN LAYER

Shigeru Shirai, Yamato; Junichiro Kanbe, and Shigeru Ohno, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,046

Claims priority, application Japan, Jan. 16, 1981, 56-5643

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—60 **26 Claims**

1. An electrophotographic image-forming member which comprises:

an electrophotographic supporting substrate;

a photoconductive layer comprising an amorphous material which contains silicon atoms as matrix and at least one of hydrogen atoms and halogen atoms; and

a resin layer formed by use of a ladder type of silicon resin, between said supporting substrate and photoconductive layer.

4,405,703

ELECTROPHOTOGRAPHIC PLATE HAVING AN AGE-HARDENED ALUMINUM SUBSTRATE AND PROCESS FOR PRODUCING THE SAME

Shigeharu Onuma; Kunihiro Tamahashi; Akira Hosoya, all of Hitachi; Atsushi Kakuta, Hitachiota; Yasuki Mori, and Hirosada Morishita, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Sep. 30, 1981, Ser. No. 307,203

Claims priority, application Japan, Oct. 3, 1980, 55/137704

Int. Cl.³ G03G *5/10*

U.S. Cl. 430—66 **8 Claims**

1. An electrophotographic plate comprising a substrate made of an age-hardening type aluminum alloy having a surface hardness of 60 Hv or higher in terms of Vickers hardness and a photoconductive layer made of amorphous selenium or a selenium alloy formed on the substrate by a vacuum evaporation method; said photoconductive layer and said substrate then having been cooled at a rate of 5° C/min. or higher.

4,405,704

TRIPHENYLMETHANE POLYMER, PROCESS FOR PRODUCTION THEREOF, AND PHOTOCONDUCTIVE COMPOSITIONS AND MEMBERS FORMED THEREFROM

Shu Watarai; Kazuo Ishii, and Takeshi Takayama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 218,227, Dec. 19, 1980, Pat. No. 4,360,660.

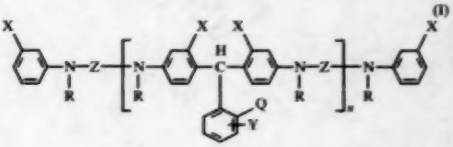
This application May 28, 1982, Ser. No. 382,047

Claims priority, application Japan, Dec. 22, 1979, 54-166306; May 16, 1980, 55-65052

Int. Cl.³ G03G *5/06*

U.S. Cl. 430—74 **7 Claims**

1. An electrophotographic photoconductive composition comprising a sensitizer and at least one triphenylmethane represented by formula (I)



wherein R is an alkyl group, X is H or a methyl group, Z is an alkylene group having 1 to 5 carbon atoms or a p-xylylene group, Y is H, a methyl group, a methoxy group, a tertiary amino group, halogen, a nitro group or a cyano group, Q is H or a methyl group, and n represents a polymerization degree sufficient to obtain an intrinsic viscosity [η] of the polymer from 0.005 to 1.000.

4,405,705

PHOTOSENSITIVE RESIN COMPOSITION CONTAINING BASIC POLYMERIC COMPOUNDS AND ORGANIC CARBOXYLIC ACIDS

Kuniomi Etoh; Masaru Nampei, and Shinichi Tanaka, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha t/a Toyoba Co., Ltd., Japan

Filed Jul. 27, 1981, Ser. No. 286,825

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **11 Claims**

1. A photosensitive resin composition which comprises (1) at least one of the group comprising basic polymeric compounds which have a molecular weight of not less than 1,000, contain basic nitrogen atoms and are themselves poor in hydrophilic properties but, which in the presence of an acidic substance, show good hydrophilic properties due to the acid-based interaction, and (2) at least one of the group comprising organic carboxylic acids which are themselves acidic but, when irradiated with light, lose their acidic property due to a chemical conversion.

4,405,706

OPTICAL INFORMATION RECORDING MEDIUM

Yonosuke Takahashi; Minoru Wada, and Eiichi Hasegawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1982, Ser. No. 388,366

Claims priority, application Japan, Jun. 12, 1981, 56-90377

Int. Cl.³ G01D *15/34*

U.S. Cl. 430—271 **19 Claims**

1. An optical information recording medium, comprising:

a plastic substrate comprised of an acrylic resin;

an undercoating layer positioned on a surface of the substrate, the undercoating layer being comprised of a compound selected from the group consisting of polyvinyl pyrrolidone and polyvinyl formal; and

a heat mode recording layer positioned on the undercoating layer, the recording layer being comprised of a metal.

4,405,707

METHOD OF PRODUCING RELIEF STRUCTURES FOR INTEGRATED SEMICONDUCTOR CIRCUITS

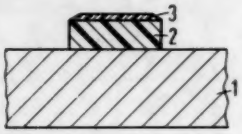
Hartwig Bierhenke, Grafing; Siegfried Birkle, Hoechstadt an der Aisch, and Roland Rubner, Roettenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 284,099

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3027941

Int. Cl.³ B05D *3/06*

U.S. Cl. 430—281 18 Claims



1. In a method for producing relief structures comprised of double lacquer layers on substrates which already contain relief structures for integrated semiconductor circuits wherein high-energy radiation, such as particulate or photon radiation, is utilized for structuring, the improvement comprising:

applying said double lacquer layer to said substrate with a lower lacquer layer positioned directly on said substrate and an upper lacquer layer positioned on said lower lacquer layer;

said lower lacquer layer being composed of a decomposable positive lacquer material which is only somewhat sensitive to particulate or photon radiation and having a sensitivity in the range of about 10 through 100 μm C/cm^2;

said upper lacquer layer being thinner relative to the thickness of said lower lacquer layer by at least a factor of 2 and being comprised of a highly sensitive negative lacquer material having sensitive of less than about 5 μm C/cm^2;

generating desired relief structures in said upper negative lacquer layer; and

removing those portions of said lower lacquer layer which are not covered by said upper negative lacquer layer.

4,405,708

METHOD OF APPLYING A RESIST PATTERN ON A SUBSTRATE, AND RESIST MATERIAL MIXTURE

Pieter van Pelt, Sunnyvale, Calif., and Jacob Wijdenes, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

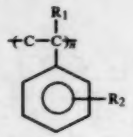
Filed Mar. 8, 1982, Ser. No. 355,977

Claims priority, application Netherlands, Mar. 12, 1981, 8101200

Int. Cl.³ G03C *5/00, 1/68*

U.S. Cl. 430—281 4 Claims

1. A method of forming a resist pattern on a substrate wherein a resist material is uniformly applied to the surface of said substrate to form a photosensitive layer thereupon, the resultant layer of resist material is selectively irradiated with actinic radiation and the irradiated portion of said layer is then removed, characterized in that the resist material is a mixture of a positive-working methylmethacrylate polymer or polymethylisopropenyl ketone and 1–25% by weight of a negative-working styrene homopolymer of the formula:



wherein R_1 is hydrogen or alkyl, R_2 is halogen, alkyl or alkoxy and n represents the degree of polymerization.

4,405,709

PROCESS FOR FABRICATING GRAVURE PRINTING PLATE BLANK

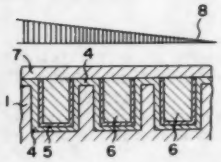
Seiji Katano, Oiso, and Masataka Atsumi, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 35,072, May 1, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,403

Claims priority, application Japan, May 4, 1978, 53-53450

Int. Cl.³ C23F *1/02;* C03C *15/00, 25/06;* B41C *1/00*

U.S. Cl. 430—307 7 Claims



1. A process for the fabrication of a gravure printing plate blank comprising the steps of providing a base having a surface, forming a multiplicity of minute pockets of equal size and uniform placement in the surface of the base, forming a non-etchable layer over the surface of the base including its portions bounding the pockets, the non-etchable layer being of a material resistive to a prescribed etchant, forming an intermediate layer within each pocket, forming thereafter a multiplicity of dot-like etchable portions by filling the pockets with a material corrodible by the prescribed etchant whereby the intermediate layer lies between the non-etchable layer and the etchable portion in each pocket, said intermediate layer being made of a material having a high degree of adhesion both to the material of the non-etchable layer and to the material of the etchable portions, and smoothing the exposed surface portions to the non-etchable layer and the surfaces of etchable portions.

4,405,710

ION BEAM EXPOSURE OF (G-GE$_x$-SE$_{1-x}$) INORGANIC RESISTS

Karanam Balasubramanyam, and Arthur L. Ruoff, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,115

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—311 8 Claims

1. A method of forming a predetermined pattern on a substrate which comprises

(a) forming a thin (g-Ge$_x$Se$_{1-x}$) film on a solid substrate by vacuum vapor deposition wherein the angle of deposition is an angle between 5° to about 85° with respect to the normal,

(b) masking a portion of said film with an ion beam penetration retarding masking material,

(c) exposing the unmasked portion of the film to an ion beam at a voltage adapted to and with an ion dose sufficient to provide a substantial differential dissolution rate between

the masked and unmasked portion of the film when developed with a solvent for said film, and

(d) developing said film by removing the exposed portion of that film to uncover the corresponding portion of the substrate while the portion of said film which was masked during the exposure remains adhered to the substrate.

4,405,711

ANALYSIS ELEMENT FOR IMMUNOCHEMICAL MEASUREMENT OF TRACE COMPONENTS AND METHOD FOR IMMUNOCHEMICAL MEASUREMENT USING THE SAME

Nobuhito Masuda; Shigeru Nagatomo, and Yuji Mihara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,812

Claims priority, application Japan, Sep. 2, 1980, 55-120599

Int. Cl.³ G01N *33/54, 33/52*

U.S. Cl. 435—4 **3 Claims**

1. In an analysis element, comprising a support having provided thereon a silver halide emulsion layer, for immunochemical assay of a trace component utilizing an immunological reaction which comprises: (1) labelling an antigen or antibody with a photographically active substance selected from the group consisting of a spectral sensitizer and a fogging agent, (2) competitively reacting said antigen or antibody labelled with said photographically active substance with an antibody or antigen which specifically reacts with the respective antigen or antibody, (3) bringing either the reaction product or the unreacted material into contact with said silver halide, (4) exposing the resulting product to light having a wavelength which said photographically active substance absorbs followed by photographic development when said spectral sensitizer is used as said photographically active substance, or developing the same without exposure to light having a wavelength which said photographically active substance absorbs when said fogging agent is used as said photographically active substance, and (5) measuring the resulting optical density of the formed silver image and/or colored dye,

the improvement which comprises a water absorbing layer is provided between said support and said silver halide emulsion layer, wherein said water absorbing layer has a thickness of from 1 to 100μ and is composed of a porous membrane, a filter paper, a fiber or a binder comprising gelatin and/or a polymer.

4,405,712

LTR-VECTORS

George F. Vande Woude, Berryville, Va.; William L. McClements, Silver Spring, Md.; Marianne K. Oskarsson, Bethesda, Md., and Donald G. Blair, Kensington, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 1, 1981, Ser. No. 279,443

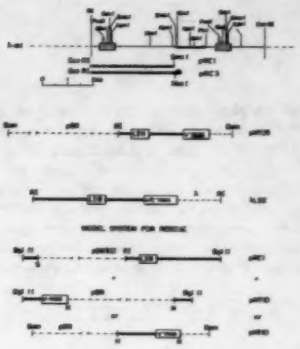
Int. Cl.³ C12Q *1/70*; C12P *21/00, 21/02*; C12N *15/00*; C12N *5/00*; C12N *1/00*; C12N *7/00*

U.S. Cl. 435—5 **10 Claims**

1. A process for activating the expression of any gene comprising the steps of:

(a) isolating the gene

(b) ligating to the gene a vector comprising the LTR sequences from a retroviral provirus genome to provide a hybrid gene



(c) inserting the hybrid gene into a mammalian recipient cell using DNA transfection

(d) screening for the phenotype of the gene.

4,405,713

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE ANTHRACYCLINE GLYCOSIDES A AND B

Akiko Fujiwara, and Tatsuo Hoshino, both of Kamakura, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 28, 1981, Ser. No. 334,620

Int. Cl.³ C12P *19/56*; C12R *1/465*

U.S. Cl. 435—78 **6 Claims**

1. A process for producing optically active anthracycline glycosides A and B with 7S-configuration comprising stereoselectively glycosidating an enantiomer with 7S-configuration starting from a racemic anthracyclinone by means of *Streptomyces galilaeus* OBB-111-848 (FERM-P No. 5316, ATCC 31598).

4,405,714

PRODUCTION OF N-SUBSTITUTED DERIVATIVES OF 1-DESOXYNOJIRIMICIN

Günther Kinast; Michael Schedel, and Wolfgang Koebernick, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

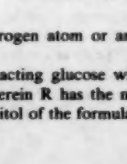
Filed Sep. 25, 1981, Ser. No. 305,656

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038901

Int. Cl.³ C12P *19/26*; C07D *211/46*

U.S. Cl. 435—84 **9 Claims**

1. A process for the production of a compound of the formula

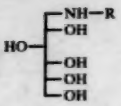


(I)

wherein

R denotes a hydrogen atom or an optionally substituted alkyl radical,

which comprises reacting glucose with a compound of the formula H_2N-R wherein R has the meaning given above to form a 1-amino-sorbitol of the formula



(IV)

wherein R has the meaning given above, reacting said 1-aminosorbitol with a compound providing a protective group which can be split off under acid conditions and is stable in the subsequent microbiological oxidation process, aerobically oxidizing the compound thus obtained microbiologically to give a protected 6-amino-sorbose, splitting off the protective group under acid conditions and hydrogenating the 6-aminosorbose salt thus obtained either after being isolated or in one operation, to give the compound of the formula (I).

4,405,715

ENZYMES IMMOBILIZED ON A SOLID SUPPORT CONTAINING CELLULOSE AND LIGNIN

Pierre Monsan, Toulouse, France, assignor to Beghin-Say, S.A., Thumeries, France

PCT No. PCT/FR80/00185, § 371 Date Dec. 18, 1980, § 102(e) Date Aug. 3, 1981, PCT Pub. No. WO81/01860, PCT Pub. Date Jul. 9, 1981

PCT Filed Aug. 3, 1981, Ser. No. 290,804

Claims priority, application France, Dec. 21, 1979, 79 31382

Int. Cl.³ C12P *19/02;* **C12N** *11/12, 11/06*

U.S. Cl. 435—105 **17 Claims**

1. In a process for preparing enzyme derivatives wherein the enzyme is fixed by a covalent bond onto a water-insoluble support by the steps of

(a) washing a support material having an oside fraction and containing essentially cellulose and more than 25% lignin with water;

(b) oxidizing the oside fraction of the support by controlled oxidation to provide aldehyde groups;

(c) condensing a diamine onto the aldehyde groups contained on the support provided by step (b) to provide an amine-supported bond; and

(d) stabilizing the amine-support bond by reduction to provide stabilized aminated groups, the improvement wherein

(i) activating the aminated groups with a dialdehyde to provide an activated support, and

(ii) coupling the enzyme onto the activated support with a covalent bond.

4,405,716

PROCESS FOR PREPARING 1-CARBA-2-PENEM-3-CARBOXYLIC ACID

Richard B. Sykes, Belle Mead, and Jerry S. Wells, Ringoes, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 23, 1982, Ser. No. 371,087

Int. Cl.³ C12P *17/18, 17/10, 7/40;* **C12R** *1/18*

U.S. Cl. 435—119 **4 Claims**

1. A process for the preparation of 1-carba-2-penem-3-carboxylic acid which comprises culturing aerobically *Erwinia carotovora* SC 12,637 A.T.C.C. No. 39048 or *Erwinia herbicola* SC 12,638 A.T.C.C. No. 39049 in a culture medium containing assimilable carbon and nitrogen sources until 1-carba-2-penem-3-carboxylic acid is accumulated, and then recovering the 1-carba-2-penem-3-carboxylic acid from the medium.

4,405,717

RECOVERY OF ACETIC ACID FROM A FERMENTATION BROTH

Branko Urbas, Darien, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 26, 1981, Ser. No. 314,627

Int. Cl.³ C07C *51/48, 51/50;* **C12P** *7/54*

U.S. Cl. 435—140 **20 Claims**

1. A process for the recovery of acetic acid from an aqueous solution of clacium acetate which comprises the steps of:

(a) adding a molar equivalent of a water-soluble tertiary amine carbonate to the calcium acetate solution to form a trialkylammonium acetate solution and a precipitate of calcium carbonate;

(b) concentrating the trialkylammonium acetate solution; and

(c) heating the concentrated trialkylammonium acetate solution to obtain acetic acid and the tertiary amine.

4,405,718

METHOD AND COMPOSITION FOR UROBILINOGEN CONTROL STANDARD

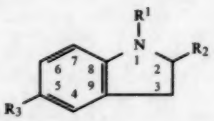
Myron C. Rapkin, Elkhart, Ind., and David L. Tabb, Beaumont, Tex., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 20, 1981, Ser. No. 284,556

Int. Cl.³ G01N *33/48, 33/72*

U.S. Cl. 436—8 **11 Claims**

1. A method of preparing a substantially odor-free urobilinogen-free urobilinogen control standard for use in testing for the presence of urobilinogen in a urine sample which closely simulates the properties of a urobilinogen-containing urine sample when reacted with a urobilinogen assay system, which comprises dissolving a substituted indole having the formula:



wherein R_1 and R_2 are the same or different and are H or unsubstituted C_1-C_4 alkyl, and R_3 is H, unsubstituted C_1-C_4 alkyl, unsubstituted C_1-C_4 alkoxy, or halogen with the proviso that R_1, R_2 and R_3 cannot simultaneously be hydrogen, in a nonionic detergent selected from the group consisting of an alkanolamide, an ethoxy alkanolamide, and ethoxy phenol and an ethoxy fatty alcohol.

4,405,719

METHOD OF STABILIZING PLATELETS FOR DETERMINING MULTIPLE PLATELET PARAMETERS IN REFERENCE CONTROL AND CALIBRATOR COMPOSITIONS; DILUENTS THEREFOR; AND COMBINATION STABILIZATION PROCEDURES

Harold R. Crews, Miami; James H. Carter, II, Ft. Lauderdale, and Ted Sena, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed May 29, 1981, Ser. No. 268,050

Int. Cl.³ C09K *3/00;* **G01N** *33/48*

U.S. Cl. 436—10 **11 Claims**

1. A method for long term stabilization of blood platelets without the use of aldehydes or other cross-linking fixative agents for use in determining multiple platelet parameters in reference controls for electronic instrumentation, which method comprises adding to platelets in a suspending fluid a stabilizing solution which is an aqueous solution of:

(1) iodoacetamide in a concentration of approximately 0.5 to 2.0 g per liter; and

(2) one or more compounds selected from the group consisting of an iminodiacetic acid in a concentration of approxi-

mately 0.5 to 2.0 g per liter, and an equivalent weight of an alkali metal or alkaline buffer salt thereof, wherein the resultant media is maintained at a preselected range of pH and osmolality.

10. A hematology reference control media for determining multiple platelet parameters utilizing electronic instrumentation comprising a suspension of platelets which is stabilized by adding a stabilizing solution which is an aqueous solution of:

(1) iodoacetamide in a concentration of approximately 0.5 to 2.0 g per liter.

(2) one or more compounds selected from the group consisting of an iminodiacetic acid in a concentration of approximately 0.5 to 2.0 g per liter, and an equivalent weight of an alkali metal or alkaline buffer salt thereof, wherein the resultant media is maintained at a preselected range of pH and osmolality.

4,405,720
SILVER STAINS FOR PROTEIN IN GELS

Carl R. Merril, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 240,577, Mar. 4, 1981, abandoned. This application Jan. 18, 1982, Ser. No. 339,886

Int. Cl.³ G01N *33/68*

U.S. Cl. 436—86 **16 Claims**

1. A silver stain method for polypeptides fixed in gels comprising the sequential steps without substantial non-ambient illumination of

photo-reversing the polypeptide-gel by treatment with an oxidizing agent,

forming a latent stain image by treating the polypeptide-gel with a photosensitive salt, and

developing the stain image by treating the polypeptide-gel with a reducing agent.

4,405,721
DIAGNOSTIC AGENT FOR THE DETECTION OF KETONE BODIES

Helmut Kohl, Wetter, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,057

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011168

Int. Cl.³ G01N *33/16, 33/48, 33/64*

U.S. Cl. 436—128 **12 Claims**

8. A diagnostic agent as in claim 7 wherein said crown ether is 12-crown-4, 15-crown-5, 18-crown-6, dibenzo-18-crown-6, or dicyclohexano-18-crown-6.

4,405,722
SEALING GLASS COMPOSITIONS

Yoshinori Kokubu, Tokyo; Jiro Chiba; Nobuyoshi Ichimura, both of Yokohama; Takashi Iwai, Yachiyo, and Toshiyasu Kawaguchi, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd. and Iwaki Glass Company Ltd., both of Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,079

Claims priority, application Japan, Jan. 23, 1979, 54-5542; Nov. 9, 1979, 54-144428

Int. Cl.³ C03C *3/12*

U.S. Cl. 501—15 **9 Claims**

1. In a sealing glass composition, used for sealing an alumina package containing a semiconductor integrated circuit, consisting essentially of low melting glass powder and refractory filler powder of low coefficient of thermal expansion, the improvement wherein said low melting glass has a composition consisting essentially of by weight %:

PbO	77.0–86.0
B_2O_3	6.0–15.0
ZnO	0.5–6.9
SiO_2	0.1–3.0
Al_2O_3	0–3.0
MgO, CaO, BaO, SrO	0–2.0
SnO_2	0–1.5
Li_2O, Na_2O, K_2O	0–1.0

wherein said refractory filler is cordierite in a proportion of 2–30% by weight of the total composition and optionally, β-eucryptite, β-spodumene, lead titanate or zircon in a proportion, respectively, not exceeding 15% by weight of the total composition wherein said sealing glass composition can achieve a matched seal to a material having a thermal expansion coefficient of $65-70\times10^{-7}$° C.$^{-1}$ (25°–400° C.) at a non-devitrified state by a heat-treatment at a temperature between 400° C. and 430° C. within a period of 10 minutes and wherein the weight loss of the composition, heat-treated at 400° to 430° C. for 10 minutes, is less than 100 mg/cm^2 when dipped in 5 wt. % nitric acid or 20 wt. % acetic acid for 10 minutes at 25° C.

4,405,723
CERAMIC FIBERS AND WOOLS AND A PROCESS FOR THEIR PRODUCTION

Adolf Kainzner; Wolfgang Gerger, both of Gmunden, and Walter Lukas, Innsbruck, all of Austria, assignors to Gmundner Zementwerke Hans Hatschek Aktiengesellschaft, Gmunden, Austria

Continuation-in-part of Ser. No. 194,826, Oct. 7, 1980, abandoned. This application Mar. 3, 1982, Ser. No. 354,447

Claims priority, application Austria, Oct. 8, 1979, 6558/79

Int. Cl.³ C03C *13/14*

U.S. Cl. 501—36 **36 Claims**

1. Ceramic fibers and wools produced from silicate-containing melts of the combusion residues of fossile fuels, said fibers and wools being characterized as comprising a melt of untreated fly ash heated to temperatures of from 700° to 1650° C.

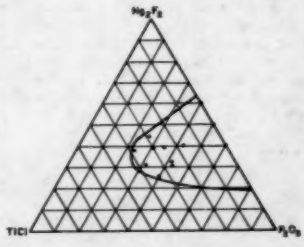
4,405,724
MERCURY THALLIUM FLUOROPHOSPHATE GLASSES

Paul A. Tick, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,033

Int. Cl.³ C03C *3/16, 3/18*

U.S. Cl. 501—44 **6 Claims**



4. A mercury thallium fluorophosphate glass having a transition temperature not over 250° C., a refractive index greater than 1.6, and being resistant to a moisture attack, the glass composition, as calculated in mole percent from the glass batch, being within and to the right of the heavy line in the appended drawing.

5. A glass having a transition temperature not over 250° C., having a refractive index greater than 1.6, being resistant to

moisture attack, and the glass containing, in weight percent on an atomic basis as analyzed, 5 to 50% Hg, 5 to 15% P, up to 60% Tl, 0 to 15% other non-alkali metals, and 0.1 to 1.0% total F+Cl+N.

4,405,725

FOAMED POLYISOCYANURATES

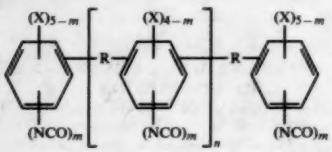
David L. Bernard, Pittsburgh; John K. Backus, Allison Park, and Anthony J. Doheny, Jr., Pittsburgh, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 687,140, May 17, 1976, abandoned, which is a continuation of Ser. No. 829,145, May 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 625,635, Mar. 24, 1967, abandoned. This application Jul. 20, 1977, Ser. No. 817,308

Int. Cl.[3] C08G *18/14*

U.S. Cl. 521—112 6 Claims

1. A foamed polymer prepared by a process which comprises reacting a mixture of polyaryl alkylene polyisocyanates having the formula:



wherein R is an organic radical obtained by removing the carbonyl oxygen from an aldehyde or ketone, m is 1 or 2, X is halogen, lower alkyl or hydrogen and n is 0.1 to 1.5 with from about 2 to about 15 parts by weight of an organic compound per 100 parts of the polyisocyanate mixture, the organic compound containing from 2 to 4 hydroxyl groups as determined by the Zerewitinoff method and having a molecular weight of 350 to 10,000, in the presence of a foam stabilizer, a blowing agent and a catalyst which will trimerize isocyanate groups.

4,405,726

CATALYSTS AND BINDER SYSTEMS FOR MANUFACTURING SAND SHAPES

George S. Everett, Clarendon Hills, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 217,451, Dec. 17, 1980, Pat. No. 4,366,267. This application Apr. 22, 1982, Ser. No. 370,984

Int. Cl.[3] C08L *45/00*

U.S. Cl. 523—144 4 Claims

1. A method of preparing a core sand material adapted for the rapid manufacture of resin bound sand shapes, said method including treating a core sand material with a catalyst selected from the group consisting of aluminum perchlorate, cupric perchlorate and chromic perchlorate to form a treated core sand material, and thoroughly mixing said treated core sand material with an acid curable resin binder material to provide a curable core sand material capable of being cured in a core-making pattern.

4,405,727

REINFORCED POLYMER COMPOSITIONS AND THEIR PREPARATION

Thomas F. Brownscombe, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 25, 1981, Ser. No. 296,032

Int. Cl.[3] C08K *3/34;* C08L *25/04*

U.S. Cl. 523—205 17 Claims

1. A reinforced thermoplastic composition comprising a thermoplastic polymer matrix having intimately distributed therein a chemically modified mineral reinforcing component, wherein said matrix is a non-elastomeric thermoplastic poly(vinylarene) and said reinforcing component is a particulate or filamentary mineral polymer-reinforcing material having chemically bonded to its surface by covalent chemical bonding a thin layer averaging about 5-500 Angstrom in thickness of silicon-free and heavy metal-free organic molecules which contain at least a substantial segment capable of interacting with said matrix polymer to provide improved adhesion, said segment having an average molecular weight at least about one-sixth that of said matrix polymer.

4,405,728

COMPOSITIONS FOR ON-SITE MANNICH POLYMER PROCESS

Richard F. Krebs, LaGrange; Patrick J. Marek, Geneva, and Kenneth G. Phillips, River Forest, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 15, 1982, Ser. No. 339,563

Int. Cl.[3] C08J *3/06;* C08L *33/26*

U.S. Cl. 523—336 9 Claims

1. A method of rapidly preparing a dilute aqueous solution of poly N,N lower dialkylaminomethyl acrylamide and copolymers thereof having a molecular weight greater than 500,000 and a cationic charge of 1-9% which comprises:

A. forming a water-in-oil emulsion of a water-soluble acrylamide polymer containing at least 10% by weight of acrylamide, said water-in-oil emulsion contaning in weight percentages:
(1) 5 to 60% polymer;
(2) 5 to 75% organic hydrophobic liquid;
(3) 0.1 to 21% low HLB water-in-oil emulsifying agent;
(4) 2 to 90% water;

B. adding to the water-in-oil emulsion of step A a water-soluble salt of a secondary amine having alkyl groups contaning 1–3 carbon atoms in an amount so as to provide 0.1–1.1 moles of secondary amine for each mole of amide functionality on said polymer;

C. preparing a dry formaldehyde composition by mixing together:
(1) paraformaldehyde;
(2) dry alkalinity control agent;
(3) water-soluble high HLB surfactant capable of inverting the water-in-oil emulsion of step A, the dry alkalinity control agent being present in an amount to provide from 0.5–1.5 moles of neutralization capability per mole of formaldehyde;

D. mixing together the water-in-oil emulsion containing the lower alkyl secondary amine salt with a quantity of the dry formaldehyde composition sufficient to provide from 0.1–1.1 mole of formaldehyde per mole of secondary amine and from 0.05–10% water-soluble surfactant based on the weight of water-in-oil emulsion used with a quantity of water, so as to obtain a 0.1–10% by weight aqueous solution of poly N,N-dialkylaminomethyl acrylamide.

4,405,729

PIGMENT GRIND WITH FUMED SILICA

Francis E. Schweitzer, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 17, 1982, Ser. No. 389,286

Int. Cl.[3] C08K *3/36;* C08L *67/02*

U.S. Cl. 523—466 3 Claims

1. In the process of formulating a pigmented coating composition, said composition comprising:
(1) inorganic pigment,
(2) a film-forming blend and a solvent for the blend,
(3) an additive to provide pseudoplastic rheology to said composition, said additive comprising fumed silica,
wherein said film-forming blend consists essentially of low molecular weight polyester oligomers, a curing agent for said oligomers, and optionally an epoxy resin or the ester of an epoxy resin and monocarboxylic acid, and said film-forming blend is present in an amount of at least 50% by weight of said composition,

the improvement wherein a co-dispersion of said inorganic pigment and at least a portion of said fumed silica is prepared and incorporated into said composition, said fumed silica being present in said co-dispersion in an amount sufficient to yield enhanced color stability to said composition.

4,405,730

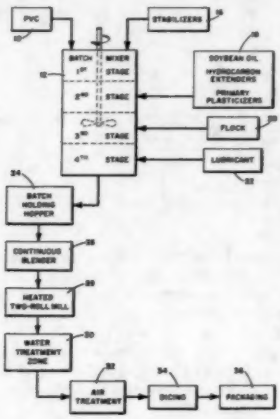
POLYVINYL CHLORIDE SHOE SOLE COMPOSITION

Arnold Cohen, Cohasset, Mass., assignor to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Division of Ser. No. 87,712, Oct. 24, 1979, Pat. No. 4,343,727. This application Jun. 22, 1982, Ser. No. 390,879

Int. Cl.³ C08L *1/02, 1/08;* **A43B** *1/14, 13/04*

U.S. Cl. 524—35 **14 Claims**



1. A polyvinyl chloride based shoe sole formed from a molding composition, said molding composition having as a primary feature a dull non-glossy surface appearance, consisting of a polyvinyl chloride homopolymer resin containing essentially from 5 to 30 parts of a natural organic cellulosic fibrous flock homogeneously dispersed therein having an average length of from about 30 to about 300 microns, and from about 75 to about 100 parts of plasticizer and from about 0.5 to about 1.5 parts of a stabilizer, all based upon 100 parts of polyvinyl chloride homopolymer resin.

4,405,731

POLYCARBONATE-STARCH COMPOSITIONS

Russell P. Carter, Jr., New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1982, Ser. No. 339,012

Int. Cl.³ C08J *5/14;* **C08L** *3/00;* **C08K** *3/34;* **B32B** *27/36*

U.S. Cl. 524—47 **15 Claims**

1. A polycarbonate molding composition comprising an aromatic thermoplastic polycarbonate resin and between 0.025 and 1.0 phr of starch.

4,405,732

FLAME RETARDANT POLYAMIDE COMPOSITIONS

Li-Chung Chao, Grand Island, and Daniel J. Scharf, East Amherst, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 126,617, Mar. 3, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,087

Int. Cl.³ C08K *5/47*

U.S. Cl. 524—83 **10 Claims**

1. A flame retardant nylon composition comprising a nylon polymer and about 0.5 to about 50 weight percent of a Zn, Mn, Ba, Ni, Co, Fe, Cu, Mo, or Cr metal salt of 2,5-dimercapto-1,3,4-thiadiazole and about 0.5 to about 25 weight percent of red phosphorus.

4,405,733

COMPOSITE QUASI-CRYSTALLINE MATERIAL

David J. Williams; Gerald R. Meredith, both of Fairport, and George R. Olin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1981, Ser. No. 289,594

Int. Cl.³ C08L *35/02*

U.S. Cl. 524—87 **19 Claims**

1. A composite material which comprises:

(a) polar quasi-crystals of photochromic spiropyran complexes of the formula A_nB, wherein A represents the uncolored photochromic spiropyran molecule and B represents the colored merocyanine form which is the product from photo-induced ring opening of A at the spiro carbon atom, and n is 2 or 3; and

(b) a polymeric support matrix; said polar quasi-crystals being present within said polymeric support matrix in a substantially polar aligned form.

4,405,734

PROCESS FOR MASS COLORING THERMOPLASTIC PLASTICS

Otto Fuchs, Grabenstätt; Adolf Kroh, Selters, and Wolfgang Teige, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

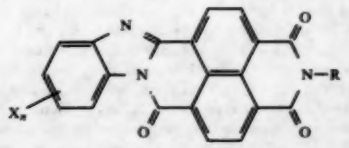
Filed Sep. 3, 1982, Ser. No. 414,812

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135328

Int. Cl.³ C08L *77/00, 67/02*

U.S. Cl. 524—90 **4 Claims**

1. A process for coloring water-insoluble thermoplastic plastics with dyestuffs of the formula



in which R denotes alkyl having 3 to 18 carbon atoms, hydroxyalkyl, alkoxyalkyl, hydroxyalkoxyalkyl, alkoxyalkoxyalkyl, carbalkoxyalkyl, carboxyalkyl or phenylalkyl having in each case 1 to 14 carbon atoms in the alkyl and alkoxy part respectively, X denotes halogen, alkyl, alkoxy, acylamino, acyl, carboxyl, carbalkoxy, carbamoyl, mono- or dialkylcarbamoyl, sulfamoyl, mono- or dialkylsulfamoyl having in each case up to 8 carbon atoms in the radicals, nitro or cyano, and n is 0 to 3, with the X substituents being identical or different, which comprises adding these dyestuffs to the melt of the thermoplastic plastic or to its precursors.

4,405,735

SUBSTITUTED DIAZASPIRODECANES, THEIR PREPARATION AND THEIR USE AS STABILIZERS FOR ORGANIC POLYMERS, AND THE POLYMERS THUS STABILIZED

Hartmut Wiezer, Gersthofen; Gerhard Pfahler, Augsburg, and Helmut Korbanka, Adelsried, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

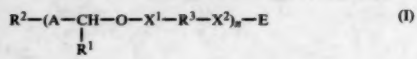
Filed Feb. 3, 1982, Ser. No. 345,250

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104294

Int. Cl.[3] **C07D** *498/10;* **C08K** *5/35;* **C08L** *79/04*

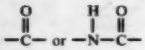
U.S. Cl. 524—95 **4 Claims**

1. A compound of the general formula (I)

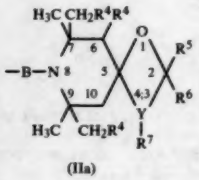


(I)

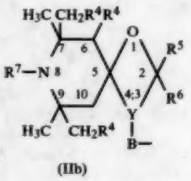
wherein n is an integer from 1 to 100, X^1 and X^2 are either identical and represent a bond or



in which n is 1, are different, in which case X^2 then has no meaning, R^1 is, if A is a group of formula (Va), hydrogen, C_1 to C_{30} alkyl, phenyl or otherwise a group of the formula (IIa) or (IIb)

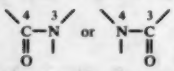


(IIa)

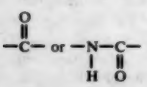


(IIb)

in which formulae Y is a radical

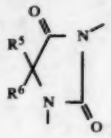


which occupies the ring positions 3;4, B is methylene, R^4 denotes hydrogen or methyl, R^5 and R^6 are identical or different and denote hydrogen, C_1 to C_{18} alkyl, phenyl which is unsubstituted or substituted by chlorine or C_1 to C_4 alkyl, or C_7 to C_{14} aralkyl which is unsubstituted or substituted by C_1 to C_4 alkyl, or, together with the carbon atom linking these radicals, form a C_5 to C_{12} cycloalkyl ring which is unsubstituted or substituted by up to four C_1 to C_4 alkyl groups, or form a piperidine ring which is unsubstituted or substituted by up to four C_1- to C_4-alkyl groups, R^7 denotes a hydrogen atom or a C_1 to C_4 alkyl group and R^2 is, if R^1 denotes a group of formula (IIb) and A denotes a bonding or A is a group of formula (Va), hydrogen or C_1 to C_{30} alkyl or phenyl, or otherwise of the formulae (II), or hydrogen in case of A=—CH_2O—, or a



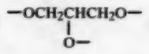
group which is substituted by C_1 to C_{18} alkyl, C_5 or C_6 cycloalkyl or phenyl and which has

linked to A, or C_2 to C_{18} alkylene, or phenylene which is unsubstituted or substituted by up to two C_1 to C_4 alkyl groups, or C_7 to C_{14} aralkylene or α,ω-dicarboxy-C_1 to-C_8 alkylene or a dicarboxy-C_6 ring or a radical>N-alkyl having 1 to 6 C atoms or a group of the formula (III)

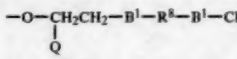


(III)

in which R^5 and R^6 have the meanings indicated above, or an isocyanuric acid radical or a nitrogen atom or a

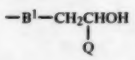


radical, R^3 represents hydrogen if X^1, X^2 and E have no meaning, or, if X^2 and E have no meaning, represents C_1 to C_{18} alkyl or phenyl, which is unsubstituted or substituted by chlorine, hydroxyl, amino or C_1 to C_4 alkyl, C_7 to C_{14} aralkyl or C_5 or C_6 cycloalkyl or denotes C_2 to C_{12} alkylene or phenylene which is unsubstituted or substituted by one to four C_1 to C_4 alkyl groups, or denotes C_7 to C_{14} aralkylene, A represents a bond or —CH_2— or —OCH_2— having —O— linked to R^2, or a group of the formula (IV)

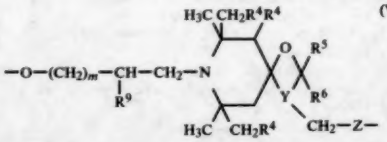


(IV)

in which Q represents a radical (IIa) or (IIb), B^1 is a bond or —O— and R^8 has the same meaning as R^2, free valences being saturated by the group



or A represents a group of the formula (Va)



(Va)

in which R^4, R^5, R^6 and Y have the meanings indicated above, Z is a bond or —CH(OH)— and R^9 represents an OH group and has the meanings of R^1, and m is 0 or 1, in oligomeric or polymeric products in which n>1 R^2, as a terminal group, is hydrogen, R^3 is a bifunctional or trifunctional radical, from the group indicated for $R^3$and A has the meaning of a bifunctional radical from the group indicated for A, and E is a group of the formula R^2—A—CH(R^1)-O-wherein R^1, R^2 and A have the meanings indicated above, or E has no meaning, and at least in formula I one of the radicals R^1, R^2 or A contains a diazaspira-

decane system of the formulae (II) or (V), or E is a terminal group which can be a lower alkyl ester, —NCO or halogen.

4. Synthetic polymers which have been stabilized against UV light decomposition and which contain 0.01 to 5 parts by weight, relative to the polymer, of a stabilizer as claimed in claim 1.

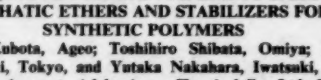
4,405,736

2,2,6,6-TETRAMETHYL-4-PIPERIDYL SPIRO ALIPHATIC ETHERS AND STABILIZERS FOR SYNTHETIC POLYMERS

Naohiro Kubota, Ageo; Toshihiro Shibata, Omiya; Kazuo Sugibuchi, Tokyo, and Yutaka Nakahara, Iwatsuki, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Jun. 9, 1981, Ser. No. 271,888
Claims priority, application Japan, Jun. 23, 1980, 55-84714
Int. Cl.[3] C07D 491/113; C08K 5/34, 5/35
U.S. Cl. 524—102 44 Claims

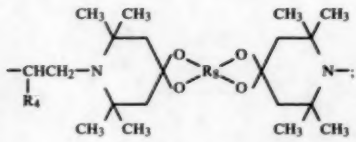
1. A compound having the formula:



(I)

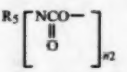
wherein:

Y is

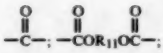


X is selected from the group consisting of alkylene having from one to about eighteen carbon atoms; cycloalkylene having from three to about eight carbon atoms; phenylene and biphenylene which when substituted with OR_3 have up to about eighteen carbon atoms; polyacyl

wherein n_1 is a number from 2 to 4; polycarbamoyl

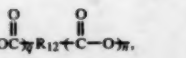


wherein n_2 is a number from 2 to 4;



and di- and trivalent phosphorous acid, phosphoric acid, phosphonous acid, phosphonic acid, boric acid and silicic acid groups;

R_1 is selected from the group consisting of hydrogen,



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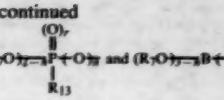
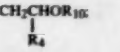


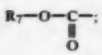
R_2 is selected from the group consisting of hydrogen and



R_3 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; phenyl; alkylphenyl having from about seven to about eighteen carbon atoms; and —X—O—R_1;

R_4 is selected from the group consisting of hydrogen; alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; phenyl; and alkylphenyl having from seven to about eighteen carbon atoms;

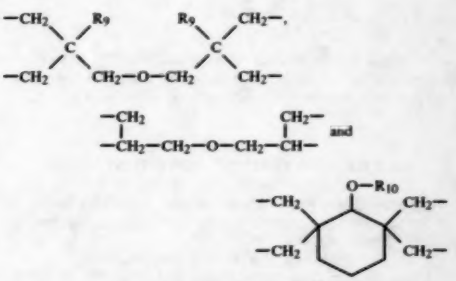
R_5 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; phenyl; alkylphenyl having from seven to about eighteen carbon atoms;



and monovalent phosphorous acid, phosphoric acid, phosphonous acid, phosphonic acid, boric acid and silicic acid groups;

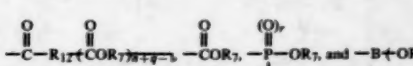
R_7 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; phenyl; alkylphenyl and cycloalkylphenyl having up to about fifty carbon atoms;

R_8 is selected from the group consisting of



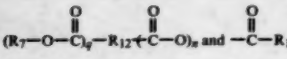
R_9 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eight carbon atoms; and —CH_2OR_{10};

R_{10} is selected from the group consisting of hydrogen,



R_{11} is selected from the group consisting of alkylene and oxyalkylene having from two to about ten carbon atoms and from zero to about five oxyether groups; cycloalkylene having from three to about eight carbon atoms; and

phenylene, alkylphenylene, and bis(phenylene) and bis(alkylphenylene) having the phenylene linked by a member selected from the group consisting of oxo, thio, alkylene having from one to nine carbon atoms, alkylidene having from three to four carbon atoms, cyclohexylidene and benzylidene; and isocyanurate;



from the group consisting of R_7 esters having q or n+q−1 R_7 ester groups of mono-, di-, tri- or tetracarboxylic acids selected from the group consisting of aliphatic mono, di, tri and tetracarboxylic acids having from one to about eighteen carbon atoms and such acids substituted with a group selected from hydroxyl, keto, amino, imino, mercapto and alkyl hydroxy phenyl groups; benzoic acid; toluic acid; benzoic acid substituted with a group selected from alkyl and hydroxyl groups; trimellitic acid; nicotinic acid; isonicotinic acid; 2,2,6,6-tetramethyl piperidine-4-carboxylic acid, 3,8,8,10,10-pentamethyl-9-aza-1,5-dioxaspiro-[5,5]-undecane-3-carboxylic acids; phthalic acid; tetrahydrophthalic acid; isophthalic acid; terephthalic acid; endomethylene tetrahydrophthalic acid; thiophene dicarboxylic acid; furane dicarboxylic acid; and dicarboxyethyl piperidine;

R_{13} is selected from the group consisting of hydrogen, R_5, and —O—R_5;

m is a number from zero to 10;

n is a number from zero to 4;

p is zero or 1;

q is a number from zero to 3; and

r is zero or 1.

35. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group:

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a 2,2,6,6-tetramethyl-4-piperidyl spiro aliphatic ether in accordance with claim **1**.

4,405,737

N-2-HYDROXYPROPYL PIPERIDINES AND COMPOSITIONS THEREOF

Bunji Hirai, Kuki; Naohiro Kubota, Ageo, and Kazuo Sugibuchi, Tokyo, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

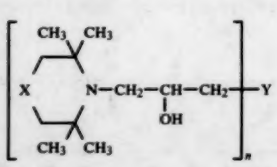
Filed Feb. 5, 1982, Ser. No. 346,424

Claims priority, application Japan, Feb. 17, 1981, 56-22039

Int. Cl.[3] **C08K** *5/45;* **C07D** *211/22*

U.S. Cl. 524—102 **35 Claims**

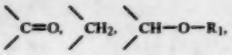
1. An N-2-hydroxypropyl piperidine having the formula:

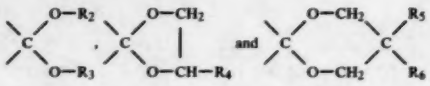


(I)

wherein

X is selected from the group consisting of





wherein

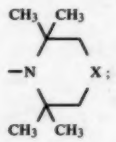
R_1 is selected from the group consisting of hydrogen; alkyl; alkenyl; cycloalkyl; alkaryl; hydroxyalkyl; oxyalkyl; carboxylic acyl; and aroyl, all of the preceding having from one to about eighteen carbon atoms;

R_2 and R_3 are each selected from the group consisting of alkyl, alkenyl, cycloalkyl, alkaryl, hydroxyalkyl, oxyalkyl and haloalkyl having from one to about eighteen carbon atoms;

R_4, R_5 and R_6 each are selected from the group consisting of hydrogen, alkyl, alkenyl, cycloalkyl, alkaryl, hydroxyalkyl, oxyalkyl and haloalkyl having from one to about eighteen carbon atoms; and —CH_2—O—R_1;

n is 1 or 2; and

Y, when n is 1, is hydroxy or



and when n is 2, is oxy—O—.

30. An olefin polymer composition having improved resistance to deterioration by light comprising an olefin polymer selected from the group consisting of polymers of alpha-olefins having from two to six carbon atoms and polystyrene, and an amount to enhance the resistance of the polymer to deterioration of an N-2-hydroxypropyl piperidine compound in accordance with claim **1**.

4,405,738

FLAME RETARDANT ADDITIVES AND FLAME RETARDANT POLYESTER COMPOSITIONS

Gerald W. McNeely, Arden, N.C., assignor to Akzona Incorporated, Asheville, N.C.

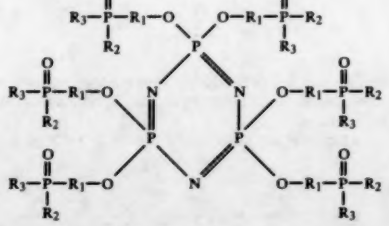
Filed Mar. 5, 1982, Ser. No. 354,981

Int. Cl.[3] **C08K** *5/51;* **C08L** *85/02*

U.S. Cl. 524—116 **23 Claims**

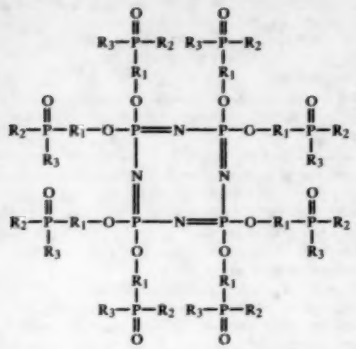
1. A cyclopolyphosphazene selected from the group of

(A) A hexa(dialkylphosphinylmethyleneoxy)cyclotriphosphazene corresponding to the formula:



and

(B) An octa(dialkylphosphinylmethyleneoxy)cyclotetraphosphazene corresponding to the formula:



where R_1 is $—CH_2—$ and each R_2 and R_3 is independently a C_1–C_4 lower alkyl or substituted alkyl group.

4,405,739

POLYPHENYLENE ETHER RESINS AND COMPOSITIONS HEAT STABILIZED WITH PHOSPHITE COMPOUNDS

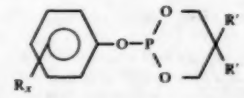
Philip L. Kinson, Rexford, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 17, 1981, Ser. No. 322,225

Int. Cl.³ C08K *5/52*

U.S. Cl. 524—117 **9 Claims**

1. A thermoplastic composition which comprises an intimate admixture of a polyphenylene ether resin with an effective amount of a thermal oxidative stabilizing agent selected from among compounds having the formula:



in which x is 0 or an integer of from 1 to 5 representing the number of substituents on the phenyl ring; R is independently hydrogen, alkyl having 1 to 10 carbon atoms, halogen or hydroxyl; and R′ is independently hydrogen, or (lower) alkyl having from 1 to 6 carbon atoms.

4,405,740

POLYARYLENE SULPHIDE COMPOSITIONS

Glyndwr J. Davies, Southall, England, assignor to The Glacier Metal Company Limited, Middlesex, England

PCT No. PCT/GB81/00127, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00153, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 2, 1981, Ser. No. 355,741

Claims priority, application United Kingdom, Jul. 4, 1980, 8022066

Int. Cl.³ G08K *5/09*

U.S. Cl. 524—287 **7 Claims**

1. A composition of matter comprising a polyarylene sulphide having a molecular weight of between 5,000 and 17,500 intimately admixed with an aryl ester of an aryl alcohol in an amount sufficient to solvate said polyarylene sulphide.

4,405,741

FAST CRYSTALLIZING POLYALKYLENETEREPHTHALATE RESIN COMPOSITIONS

Chung J. Lee, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Filed Sep. 20, 1982, Ser. No. 420,569

Int. Cl.³ C08K *5/12, 5/06;* **C08L** *67/02*

U.S. Cl. 524—299 **15 Claims**

1. A fast crystallizing molding composition comprising essentially:

a. a polyalkyleneterephthalate in which the alkylene group has 2–4 carbon atoms;

b. a complex of NaSCN and a polymeric compound having at least two recurring units having the formula $—CH_2C-H_2O—$, the amount of said complex being enough to give a proportion of 0.05–4 percent by weight of NaSCN based on the weight of said polyalkyleneterephthalate.

4,405,742

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYCHLOROPRENE AND ITS USE AS A STARTING MATERIAL FOR ADHESIVES

Rüdiger Musch; Rüdiger Schubart, both of Berg-Gladbach; Wilhelm Göbel, Leverkusen; Heinrich Alberts, Cologne, and Gerhard Hohmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

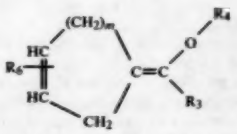
Filed Jun. 30, 1981, Ser. No. 280,018

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025076; Jul. 2, 1980, 3025077; Jul. 12, 1980, 3026502

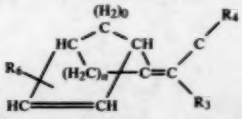
Int. Cl.³ C09J *3/12;* **C08F** *2/38, 2/24*

U.S. Cl. 524—315 **8 Claims**

1. A process for the production of high molecular weight polychloroprene having a viscosity in the range of from 80 to 200 MU by polymerizing chloroprene with from 0 to 20% by weight of a comonomer copolymerizable therewith in aqueous emulsion in the presence of a regulator at a temperature of from 0° to 60° C. up to a monomer conversion of from 50 to 96%, characterized in that a compound of the formula



or a compound of the formula



is added in a quantity of from 0.05 to 3% by weight, based on 100 parts by weight of monomer, at the beginning of the reaction, during or after polymerization but at the latest before residual monomers are removed, m being a number of from 1 to 8; n being a number of from 1 to 7; o being a number of from 1 to 4; R_3 being hydrogen, C_1–C_{19}-alkyl, C_2–C_{19}-alkenyl, phenyl, C_1–C_4-alkylene phenyl, acryl, formyl or acetyl; R_4 being C_1–C_{19}-alkyl, C_2–C_{19}-alkenyl, phenyl, C_1–C_4-alkylene phenyl, acryl, C_5–C_{12}-cycloalkyl or C_5–C_{12}-cycloalkenyl and R_6 being hydrogen, C_1–C_5-alkyl or C_2–C_5-alkenyl.

4,405,743

PYRAZOLYLPYRIMIDINE DERIVATIVES

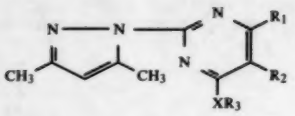
Tamio Nishimura, Sagamihara; Yoshiko Miyamoto, Kawasaki; Hiroshi Ohyama, Chigasaki; Hiroshi Yamamura, Oiso; Ken Morita, Atsugi; Kuniomi Matsumoto, Machida, and Tetsuro Watanabe, Yokohama, all of Japan, assignors to Hokko Chemical Industry Co., Ltd. and Meiji Seika Kaisha Ltd., both of Tokyo, Japan

Continuation of Ser. No. 71,691, Aug. 31, 1979, abandoned. This application Oct. 15, 1981, Ser. No. 311,655

Int. Cl.³ A61K *31/505;* C07D *403/04*

U.S. Cl. 424—321 2 Claims

2. A fungicide composition comprising as active ingredient, a fungicidally effective amount of a pyrazolylpyrimidine of the formula



wherein R_1 is hydrogen or C_{1-6} alkyl, R_2 is hydrogen or C_{1-4} alkyl, X is oxygen or sulfur and R_3 is lower alkyl, phenyl or phenyl substituted with from 1 to 3 substituents selected from the group consisting of halogen, C_{1-4} alkyl, methoxy, methylthio, cyano, nitro, trifluoromethyl and carbethoxy; provided that when R_1 is C_{1-6} alkyl, R_2 is C_{1-4} alkyl and X is sulfur, R_3 is ethyl or when R_1 is C_{1-6} alkyl, R_2 is hydrogen and X is oxygen, R_3 is said substituted phenyl in a suitable carrier.

4,405,744

FILLER FOR PAPER, CARD OR BOARD, A PROCESS FOR ITS MANUFACTURE, AND PAPER, CARD OR BOARD CONTAINING THE FILLER

Herbert Greinecker, Hallein, and Gerhard Stern, Linz, both of Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

Filed May 20, 1981, Ser. No. 265,570

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020854

Int. Cl.³ C08L *61/10, 33/26*

U.S. Cl. 524—423 7 Claims

1. A filler for paper, card or board, which has a good retention comprising a substantially water insoluble, white and inorganic core material and a hydrophilic coating in an amount of 0.5 to 10% by weight, consisting of a polyacrylamide or its mixture with a urea-formaldehyde condensation resin, wherein the molar ratio of urea:formaldehyde is at least 1:1.2, said polyacrylamide having a molecular weight of 10^5 to 10^7 and having been made water-insoluble by crosslinking to an extent that it is able to swell and to become tacky in the presence of water.

4,405,745

POLYMER STABILIZATION

Ronald D. Mathis, and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 24, 1982, Ser. No. 422,786

Int. Cl.³ C08K *3/28*

U.S. Cl. 524—429 12 Claims

1. A polymer composition exhibiting improved heat stability comprising an arylene sulfide polymer containing an effective stabilizing amount sufficient to retard polymer curing and cross-linking of at least one alkaline earth metal nitrite.

4,405,746

AQUEOUS, ADHESIVE COATING COMPOSITION WITH A NON-SELF-CROSSLINKABLE ELASTOMER FOR USE WITH FILAMENTARY MATERIALS

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 27, 1981, Ser. No. 238,725

Int. Cl.³ C08L *61/10*

U.S. Cl. 524—501 17 Claims

1. An aqueous adhesive coating composition for treating filamentary materials to reinforce elastomeric matrix materials, comprising:

A. a vinyl-pyridine-containing elastomeric latex selected from the group consisting of an elastomeric copolymer latex produced from a vinyl pyridine-containing monomer and 1,3-diene hydrocarbon monomer and an elastomeric terpolymer latex produced from vinyl pyridine-containing monomer, 1,3-diene hydrocarbon monomer and a vinyl-containing monomer,

B. phenolic aldehyde condensate polymer,

C. non-self-crosslinkable elastomeric homopolymer or interpolymer latex wherein the elastomer has been formed by the reaction of 1,3-diene hydrocarbon monomers, and where the elastomeric latex has a gel content of less than 40% and an average particle size of less than around 2000 angstroms present in the coating composition in a predominant amount over the amount of the vinyl pyridine-containing copolymer or terpolymer,

D. carboxylated butadiene-styrene copolymer present in the amount of about 0.5 to about 3 weight percent of the dried solids of the aqueous coating composition,

E. and water.

4,405,747

AQUEOUS POLYVINYL ESTER DISPERSION, PROCESS FOR ITS PREPARATION, AND THE USE

Werner Ehmann, Frankfurt am Main, and Helmut Rinno, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,883

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115163

Int. Cl.³ C08F *18/08;* C08L *31/02;* C08J *3/06;* C09J *3/14*

U.S. Cl. 524—503 4 Claims

1. An aqueous polyvinyl ester dispersion having a solids content of 40 to 70 percent by weight, in which a part of the solids is a waxy, fatty or oily additive, which dispersion consists essentially of 5 to 60 percent by weight of a waxy, fatty or oily additive and 3 to 15 percent by weight (relative to the total amount of polyvinyl ester and additive) of a polyvinyl alcohol which has a degree of hydrolysis of 65 to 99.5 mole percent and which has, at a 4 percent by weight strength aqueous solution, a viscosity of 2 to 50 mPa.s, measured at a temperature of 20° C.

4,405,748

HIGH-IMPACT POLYAMIDE MOULDING COMPOSITIONS

Werner Nielinger, Krefeld; Christian Lindner, Cologne; Ulrich Grigo, Krefeld; Rudolf Binsack, Krefeld; Friedrich Fahnler, Krefeld, and Bert Brassat, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 278,337

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025606

Int. Cl.³ C08L *77/00;* C08K *3/40*

U.S. Cl. 524—504 6 Claims

1. A thermoplastic moulding composition comprising:

(I) from more than 35 to less than 99% by weight of polyamide; and

(II) from more than 1 to less than 65% by weight of a graft product produced from

(a) 70 to 95% by weight of a cross-linked (co)polymer of butadiene and/or substituted butadiene, which consists of at least 95% by weight of optionally substituted butadiene units, as the graft substrate and

(b) 5 to 30% by weight of methyl methacrylate as graft monomer,

the gel content of the graft substrate amounting to ≧70%, as measured in toluene, the grafting yield G to ≧0.15 and the average particle diameter of the graft copolymer to between 0.2 and 0.6μ; optionally

(III) from 10 to 60% by weight, based on the total moulding composition, of reinforcing materials; and optionally

(IV) standard auxiliaries and additives,

the total sums of I to IV and of (a) and (b), respectively, amounting always to 100% by weight.

4,405,749

THERMOPLASTIC ELASTOMER COMPOSITIONS

Suzanne B. Nelsen, Bergenfield, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 196,958, Oct. 14, 1980, Pat. No. 4,355,155. This application Jun. 4, 1982, Ser. No. 385,165

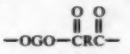
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.³ C08K 5/34; C08L 67/02

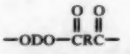
U.S. Cl. 524—100 7 Claims

1. White thermoplastic elastomer composition consisting essentially of:

(a) segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented by the formula



and said short chain units being represented by the formula



where G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a difunctional polyether glycol having a molecular weight in the range from about 400 to about 6,000, R is a hydrocarbon radical remaining after removal of the carboxyl groups from terephthalatic acid or isophthalic acid, and D is a divalent radical remaining after removal of hydroxyl groups from 1,4 butanediol or 1,4 butenediol; provided,

(i) said short chain segments amount to between about 30% and about 85% by weight of the copolyester, and

(ii) between about 10% and about 40% of the D groups represent divalent radicals remaining after removal of hydroxyl groups from 1,4 butenediol; and

(b) between about 0.1% and about 5% by weight of said copolyester of 3,5-di-tert-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris-(2-hydroxyethyl)-s-triazine-2,4,6-(1H, 3H, 5H) trione.

4,405,750

COLORED CYANOACRYLATE ADHESIVE COMPOSITION

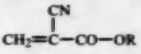
Tiaki Nakata, Ibaraki; Noriyuki Kawazoe, Motomachi, and Toshio Takenaka, Toyono, all of Japan, assignors to Sumitomo Chemical Company, Ltd. and Taoka Chemical Company, Ltd., both of Osaka, Japan

Filed Sep. 13, 1982, Ser. No. 417,155

Int. Cl.³ C08L 33/14

U.S. Cl. 524—717 4 Claims

1. An adhesive composition comprising an α-cyanoacrylate having the formula,



wherein R is a C_1–C_{16} alkyl, C_2–C_6 alkenyl, C_1–C_6 alkoxy C_2–C_4 alkyl, tetrahydrofurfuryl, phenyl or cyclohexyl group, and at least one dye selected from the group consisting of C.I. Solvent Green 5, C.I. Acid Red 50 and C.I. Acid Red 52.

4,405,751

AQUEOUS AMINOPLASTIC RESIN DISPERSIONS

Hanns P. Müller, Odenthal; Kuno Wagner, Leverkusen; Peter Mummenhoff, Cologne; Gottfried Wallpott, Neuss, and Karl-heinz Scheuss, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

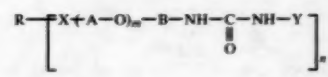
Filed Mar. 8, 1982, Ser. No. 355,644

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112435

Int. Cl.³ C08L 61/28

U.S. Cl. 524—720 9 Claims

1. Aqueous dispersions of aminoplastic resins obtained by condensation of aldehydes with aminoplastic resin formers in aqueous medium, in the presence of water-soluble compounds of the formula



(I)

wherein

R represents an n-valent hydrocarbon radical,

X represents O, NR', —CONH— or —COO—,

A represents a similar or different alkylene radical,

B represents —CHR'— or —OC—NH—Z—,

Y represents H or an optionally substituted alkyl radical,

R' represents H, lower alkyl or phenyl and

Z represents a radical such as that formed by removal of the isocyanate groups from an organic diisocyanate,

n represents an integer from 1 to 6 and

m represents an integer from 5 to 100.

4,405,752

PROCESS FOR PRODUCING FIBER-REINFORCED MOLDED PRODUCTS

Klaus Recker, Cologne; Gerd Reinecke, Bergisch-Gladbach; Albert Awater, Odenthal; Gerhard Grögler, and Karl J. Kraft, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,389

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2941051

Int. Cl.³ C08L 75/04

U.S. Cl. 524—847 10 Claims

1. A process for the production of fiber-reinforced molded products, comprising:

(1) mixing at a temperature of from 10° to 50° C.,

(a) 7 to 35% by weight of a polyisocyanate having a melting point above 100° C., and
(b) 14 to 35% by weight of a polyisocyanate which is liquid at the reaction temperature of mixing with
(c) 43 to 62% by weight of one or more compounds having molecular weights of 300 to 10,000 containing 2 to 8 hydroxyl groups, and
(d) 3 to 10% by weight of a chain-lengthening agent having a molecular weight of 62 to 250 containing 2 to 4 hydroxyl groups,
(e) 0 to 5% by weight of a compound having a molecular weight below 1,000 containing from 2 to 4 amino groups or an equivalent quantity of water,
(f) 0 to 5% by weight of a molecular sieve of the sodium aluminum silicate type, and
(g) 0 to 5% by weight of one or more activators,
all percentages being based on the total weight of (a) through (g), and components (b) through (e) being liquid at the chosen reaction temperature of mixing and having an average functionality of isocyanate-reactive groups of 2.5 to 3.5, the equivalent ratio of isocyanate groups in component (b) to isocyanate-reactive hydrogen atoms in components (c) through (e) being from 0.4:1 to 0.85:1 and the equivalent ratio of isocyanate groups in component (a) to isocyanate-reactive hydrogen atoms in components (c) through (e), taking into account any masked isocyanate groups being from 0.15:1 to 1.2:1, with the proviso that the average functionality of components (c) through (e) should be at least 2.65 when the first-mentioned equivalent ratio is less than or equal to 0.65:1 and not more than 3.0 when the equivalent ratio is greater than or equal to 0.70:1;
(2) adding a fiber material having a fiber length of from 10 to 100 mm; and
(3) after storing for from one hour to four days, curing and shaping the molding compound at a temperature above 90° C. and at a pressure of from 20 to 300 bars.

4,405,753
POLYBLENDS

Gary L. Deets, and Quiriano A. Trementozzi, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 3, 1982, Ser. No. 345,286
Int. Cl.³ C08L *61/04*
U.S. Cl. 525—68 **4 Claims**

1. A polyblend comprising:
A. from 40 to 60% by weight of a polyphenylene oxide;
B. from 10 to 30% by weight of a polymer comprising: from 2 to 15% by weight of an unsaturated nitrile monomer; from 65 to 94% by weight of a vinylaromatic monomer; and from 5 to 20% by weight of a rubber having a glass transition temperature below 0° C.; and
C. from 10 to 30% by weight of a polymer comprising from 2 to 18% of an ethylenically unsaturated dicarboxylic acid anhydride, from 95 to 65% by weight of a vinylaromatic monomer, and from 0 to 12% by weight of a rubber having a glass transition temperature below 0° C.; in which
(i) the weight proportion of rubber in the polyblend is less than 8%; and
(ii) the proportions of the nitrile monomer and the anhydride monomer are selected such that, when plasticized only with four parts of triphenyl phosphate for each 100 parts by weight of Component A, the Izod impact strength of annealed compression molded samples of the polyblend measured according to ASTM Procedure D-256 is at least 50 joules/meter notch and the distortion temperature under load of similar samples measured according to ASTM Procedure D-648, is at least 110° C.

4,405,754
HAZE-FREE, CLEAR, IMPACT-RESISTANT RESINOUS POLYMERS

George A. Moczygemba, Bartlesville, Okla., and Kishore Udipi, East Longmeadow, Mass., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 13, 1982, Ser. No. 339,251
Int. Cl.³ C08L *25/10, 9/06, 53/02*
U.S. Cl. 525—102 **17 Claims**

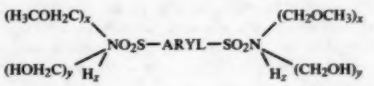
1. In a process of coupling an alkali metal-terminated polymer derived from the solution polymerization of at least one conjugated diene, monovinylarene, or both, the improvement which comprises employing an effective amount of coupling agents comprising at least one lactone and at least one halosilane wherein said halosilane contains at least two halogen atoms per molecule; and wherein the total amount of said coupling agents is in the range of about 0.2 to 20 mhm, and the mole ratio of lactone:halosilane is in the range of about 1:5 to 20:1.

4,405,755
NOVEL N-METHYLOLATED/METHOXYMETHYLATED ARYLDISULFONAMIDES

Hans Dressler, Monroeville, Pa.; Donald A. Lederer, and James Noe, both of Wadsworth, Ohio, assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 10, 1981, Ser. No. 329,198
Int. Cl.³ C08L *7/00, 9/06*
U.S. Cl. 525—138 **17 Claims**

1. Methylolated/methoxymethylated disulfonamides of the general formula:



wherein x is between about 1 and 2, and y is between about 1 and 3, z is between about 0 and 1.5, the total of x, y and z being about 4.

4,405,756
CO-VULCANIZABLE RUBBER COMPOSITION

Motofumi Oyama, Yokosuka, and Kinro Hashimoto, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,586
Claims priority, application Japan, Sep. 2, 1981, 56-138212
Int. Cl.³ C08L *9/02*
U.S. Cl. 525—237 **5 Claims**

1. A rubber composition co-vulcanizable with a sulfur cure system, said composition comprising
(1) 95 to 20% by weight of a partially hydrogenated unsaturated nitrile-conjugated diene copolymer rubber in which at least 50% of units derived from the conjugated diene are hydrogenated.
(2) 5 to 80% by weight of an ethylene-propylene-nonconjugated diene terpolymer rubber, and
(3) a required amount of at least one vulcanization accelerator selected from the group of thiuram accelerators and dithiocarbamate accelerators.

4,405,757

MACROMOLECULAR COMPLEXES OF AMIDOCARBONYLIC WATER-SOLUBLE POLYMERS AND SQUARE PLANAR PLATINOUS AND EQUIVALENT ORGANOMETALLICS

Bobby A. Howell, 1948 Willow Dr., Mount Pleasant (County of Isabella), Mich. 48858, and Erik W. Walles, 4369 E. Wing Rd., Mount Pleasant, Mich. 48858

Filed Sep. 14, 1979, Ser. No. 75,722
Int. Cl.³ C08F 8/42
U.S. Cl. 525—326.9 43 Claims

1. A complexed chemical composition comprising, in effectively bonded association:

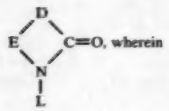
a normally water-soluble polymerizable compound having amidocarbonylic units in its structure and polyerizates of same and other amidocarbonylic polymerizates from nitrogenous precursors therefor (i.e., "WSP") as the complectant in and for the complex; and

a square planar platinous and equivalent metalled organometallic compound (i.e., "SPOM") as the complectate in and for the complex;

said WSP being a member of the polymer-providing materials and polymerizates selected from the Group consisting of: monomers and polymers and mixtures thereof of the hereinafter-defined Formula (I); and polymers and mixtures thereof of the hereinafter-defined Formula (II); and any of their possible mixtures;

said SPOM being an organometallic compound of the hereinafter-defined Formula (III);

the general arrangement of Formula (I) being:



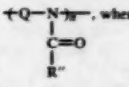
(I)

"D" is selected from the Group consisting of: oxygen; amino, methylene; alkyl-substituted methylenes of the structure "CHR—" in which R contains from 1 to about 3 carbon atoms; methylene carbonyl; ethylene carbonyl; and amido anhydride;

"E" is a divalent link of 2 to 3 carbon atoms having the structure "—(CHR′)$_x$" in which x is an integer of value 2 to 3 and R′ is hydrogen with the exception that in any single given instance R′ can be selected from the Group consisting of: hydroxyl; alkyl radicals containing from 1 to about 3 carbon atoms; haloalkyl radicals containing from 1 to about 30 carbon atoms; phenylalkyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; halophenylalkyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; cycloalkyl radicals containing from about 5 to about 6 carbon atoms; alkyl-substituted about 5 to about 6 carbon atom-containing cycloalkyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; halogenated alkyl-substituted about 5 to about 6 carbon atom-containing cycloalkyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; phenyl radicals; alkyl-substituted phenyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; halophenyl radicals; alpha-naphthyl radicals; alkyl-substituted alpha-naphthyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; halogenated alpha-naphthyl radicals; halogenated alkyl-substituted alpha-naphthyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms and halogen attachment to the extent present is randomly positioned throughout the radical structure; beta-naphthyl radicals; alkyl-substituted beta-naphthyl radicals in which the alkyl unit contains from about 1 to about 30 carbon atoms; halogenated beta-naphthyl radicals; halogenated alkyl-substituted beta naphthyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms and halogen attachment to the extent present is randomly positioned throughout the radical structure; haloalkyl-substituted phenyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms; and halogenated alkyl-substituted phenyl radicals in which the alkyl unit contains from 1 to about 30 carbon atoms and halogen attachment to the extent present is randomly positioned throughout the radical structure; and

"L" is selected from the Group consisting of: vinyl; allyl; and isopropenyl;

the general arrangement of Formula (II) being:



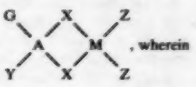
(II)

"Q" is an alkylene radical selected from the Group consisting of those of the structures "—(CH$_2$)$_{1-4}$"; and "—(R$_s$-CH)$_{1-2}$" in which R$_s$ is a lower alkyl radical containing from 1 to about 6 carbon atoms; and

"R″" is a radical containing in total from 1 to about 10 carbon atoms and is selected from the Group of those having said quantitative carbon-atom-limitations consisting of: alkyl radicals; alkyl-substituted alkyl radicals; haloalkyl radicals; halogenated alkyl-substituted radicals in which the halogen attachment to the extent present is randomly positioned throughout the radical structure; alkyl-substituted cycloalkyl radicals; halogenated alkyl-substituted cycloalkyl radicals in which the halogen attachment to the extend present is randomly positioned throughout the radical structure; and aminoalkyl radicals; with

"n" being an integer of from 2 to about 5,000;

the general arrangement of Formula (III) being:



(III)

"M" is a purposively oxidation-numbered, combined, metaliferous constituent capable of accepting 8 orbital electrons from ligands at the interconnecting level of the metallic atoms selected from the Group consisting of: Pt(II); Pd(II); Ni(II); Rh(I); Ir(I); Au(III) and Cu(II), each of which is capable of making tetraligandal attachments;

each "Z" is a ligand that as a radical is monovalent when individually taken and divalent when taken as a single, paired cluster of both of the Z's in coalescence and which can be independently chosen when monovalent and is selected from the Group consisting of: chloro; bromo; fluoro; iodo; ammonia; nitrate, divalent 1,2-diaminocyclohexane; cyclopropylamine; cyclobutylamine; cyclopentyl amine; cyclohexyl amine; ethylene imine; propylene imine; butylene imine; substituted amines of the structure "—NR$_s$H$_2$" in which R$_s$ is a lower alkyl radical containing from 1 to about 6 carbon atoms; monovalent and divalent ethylene diamine; substituted carboxylates of the structure "—O—CO—R$_a$" in which R$_a$ is a radical containing in total from 1 to not more than about 10 carbon atoms and in its characterizability is any one of those that are alkyl, cycloalkyl, cycloalkyl-substituted alkyl and aryl-substituted alkyl; divalent dibasic acids of the structure "—O—CO—(CH$_2$)$_{0-3}$—CO—O—"; univalent half-acid dibasic acids of the structure "—O—CO—(CH$_2$)$_{0-3}$—CO—OJ" in which J is any one of the alkali metals and ammonium; divalent 1,2-cycloalkane dicarboxylates of the structure "—O—CO—CyAlk—CO—O" in which CyAlk in its characterizability is any one of those containing in total from 3 to about 10 carbon atoms exclusive of the carboxylate carbons that are cycloalkane, halocycloal-

kane, alkyl-substituted cycloalkane, cycloalkyl-substituted cycloalkane and aryl-substituted cycloalkane;

divalent 1,2-aryl dicarboxylates of the structure "—O—CO—Ar—CO—O—" in which Ar in its characterizability is any one of those containing in total from 6 to about 12 carbon atoms exclusive of the carboxylate carbons that are aryl, haloaryl, alkyl-substituted aryl, cycloalkyl-substituted aryl, aryl-substituted aryl, halogenated alkyl-substituted aryl, halogenated cycloalkyl-substituted aryl and halogenated aryl-substituted aryl; monovalent glycerates of the structure "—O—CO—CHOH—CH_2OH"; any of the members of the below-defined Group for the substituent Y; any of the members of the below-defined Group for the entity A when that entity is in bidentate ligandal attachment to M and accordingly in effect constituting a divalent paired cluster of both Z's including clustered Z's independently integral and linking said entity A to M, clustered Z's connected with at least a single substituent grouping on said entity A and clustered Z's founded as constitutional and integral component atoms in said entity A; and any of the members of the below-defined Group for the substituent G depending from said entity A;

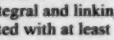
"A" is an entity that in its characterizability is any one of those that are aromatic and heterocyclic and which is in bidentate ligandal connection with both members of the below-defined Group for the divalent, linking X units including independently integral X's connected with and accepting said entity A, independently integral X's interlinkingly connected with at least a single substituent grouping on said entity A and X's founded as constitutional and integral component atoms in said entity A and which entity A is selected from the Group consisting of: an X-connected substituted benzene that has 0–3 G substituents and 1–4 Y substituents therefrom depending; an X-connected substituted naphthalene that has 0–5 G substitutents and 1–6 Y substitutents therefrom depending; an X-connected substituted bipyridyl that has 0–5 G substituents and 1–6 Y substituents therefrom depending; an X-connected substituted 1,8-naphthpyridine that has 0–5 G substituents and 1–6 Y substituents therefrom depending; an X-connected 1,9-anthracene that has 0–7 G substituents and 1–8 Y substituents therefrom depending; an X-connected 4,5-phenanthrene that has 0–7 G substituents and 1–8 Y substituents therefrom depending; an X-connected 1,2-fluorene that has 0–5 G substituents and 1–6 Y substituents therefrom depending; and an X-connected 4,5-phenanthroline that has 0–7 substituents and 1–8 Y substituents therefrom depending;

"Y" is at least a single substituent depending from said entity A that is selected and done independently so when in plurality from the Group consisting of: hydroxyl radicals; sulfhydryl radicals; sulfonic acid radicals; nitro radicals; carboxylate radicals; omega carboxylic acid ether radicals of the structure "O—$O(CH_2)_{1\text{-}6}$CO—OH"; chloro omega carboxylic acid ether radicals; bromo omega, carboxylic acid ether radicals; sulfonyl radicals; imino radicals; thiosulfonic acid radicals following the general typical structure "—O—OSS—OH"; substituted ureido radicals of the structure

"—N—C—N—H";

ureylene radicals of the structure "—NR_5—CO—N—H"; in which R_5 is a lower alkyl unit containing from 1 to about 6 carbon atoms; amido radicals of the structure "—CO—NH_2"; alkali metal salts of any of said above-described Y radicals; and ammonium salts of any of said above-described Y radicals;

each "X" is an at least equivalently if not actually divalent in function linking unit depending on residual protonation therein and thereof which makes paired connection between "M" and the entity "A" and each of which X units can be identical or independently different excepting when both X's are the N's in said above-identified heterocyclic entities for "A", which X units are selected from the Group consisting of: bivalent oxygen (i.e., "—O—"); bivalent sulfur (i.e., "—S—"); bivalent amine (i.e., "—NH_2—"); bivalent sulfoxyl units (i.e., "—SO_3—"); bivalent carboxyl units (i.e., "—COO—"); effectively bivalent 1–6 methylene group(s)-containing omega carboxylic acid ether units and chloro- and bromo- substituted derivatives thereof; effectively bivalent derivatives of mercapto carbonyl units (i.e., "—CO—S—"); effectively bivalent derivatives of hydroxy(thiocarbonyl) units (i.e., "—CS—O—"); effectively bivalent 0–6 methylene group(s)-containing omega mercapto(thiocarbonyl) ether units and chloro- and bromo- derivatives thereof; effectively divalent sulfonyl units (i.e., "—SO_2—"); effectively divalent imino units



(i.e., "—N—");

effectively divalent thiosulfonic acid units of representative structure "—O—SSO—O"; effectively divalent substituted ureido units.

4,405,758

VULCANIZABLE ACRYLATE RUBBER COMPOSITIONS

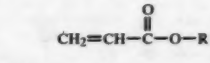
Dane E. Jablonski, Brunswick, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 17, 1982, Ser. No. 379,215

Int. Cl.³ C08F *8/34*

U.S. Cl. 525—329.8 **8 Claims**

1. A composition comprising (1) an acrylate rubber containing (a) from about 40 percent to about 98 percent by weight of an acrylate of the formula



CH_2=CH—C(=O)—O—R

wherein R is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl, an alkylthioalkyl, and a cyanoalkyl radical containing 2 to about 12 carbon atoms, (b) from about 0.1 percent to about 30 percent by weight of a halogen-containing monomer selected from the group consisting of halogen-containing vinylene hydrocarbons and halogen-containing vinyl monomers having the halogen group at least two carbon atoms removed from an oxygen atom, (c) from about 0.1 percent to about 20 percent by weight of an unsaturated carboxyl-containing monomer, containing 3 to about 8 carbon atoms, and (d) 0 to 35 percent by weight of a copolymerizable monomer containing a terminal vinylidene group, and (2) as the curative, vulcanizing amounts of sodium stearate and tetramethyl thiuram disulfide or a Group IB, IIB, IVA, or VIA metal salt thereof.

4,405,759

PROCESS FOR HALOGENATION OF BUTADIENE POLYMER IN THE PRESENCE OF ALUMINUM-CONTAINING MATERIAL

Asvinkumar N. Jagtap, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 5, 1982, Ser. No. 365,438

Int. Cl.³ C08F *8/22*

U.S. Cl. 525—356 **52 Claims**

1. In a process for producing halogenated butadiene polymer wherein butadiene polymer dissolved in solvent is reacted with chlorine, bromine or a mixture thereof under conditions that would lead to crosslinking of said halogenated butadiene polymer, the improvement comprising conducting at least a portion of said reaction in the presence of a crosslinking-reducing

amount of aluminum-containing material comprising trialkyl aluminum, dialkyl aluminum halide, alkyl aluminum dihalide, alkyl aluminum sesquihalide, aluminum trihalide or a mixture thereof, to substantially reduce said crosslinking.

4,405,760

CHLORINATION AND CROSSLINKING OF SELECTED POLYMERS WITH Cl_2O OR HOCL

Edward G. Howard, Jr., Hockessin, and Frank D. Marsh, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 28, 1981, Ser. No. 334,910
Int. Cl.³ C08F *8/20*
U.S. Cl. 525—383 **23 Claims**

1. A process for the substitutive chlorination of one or a mixture of organic polymers having a backbone composed predominantly of carbon atoms and being substantially free of carboxamide linkages and readily oxidizable groups, said organic polymers additionally having one or both of these characteristics: (i) a repeating unit comprising at least one saturated carbon bearing at least one hydrogen, and (ii) a repeating unit comprising carbon-to-carbon unsaturation, the process comprising contacting the polymer(s) with Cl_2O or HOCl, thereby substitutively chlorinating the polymer(s) at the saturated carbon, and crosslinking and adding chlorine across the carbon-to-carbon unsaturation.

4,405,761

NON-EMISSIVE, FLAME-RETARDANT COATING COMPOSITIONS

Stephen D. Rodgers, Bowie, Md.; Richard J. Dick, Columbus, and Vincent D. McGinniss, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 23, 1980, Ser. No. 199,843
Int. Cl.³ C08L *63/10*
U.S. Cl. 525—404 **18 Claims**

1. A room-temperature curable, non-emissive, flame-retardant coating composition which comprises:

(A) a flame-retardant polymer selected from
  (1) an air-dryable flame-retardant polymer,
  (2) a room-temperature curable mixture of a flame-retardant polymer and curing agent therefor; and
  (3) mixtures thereof;

(B) a solvent selected from
  (1) water,
  (2) a liquid, curable, non-emissive, non-flame promoting solvent comprising a polyhalogenated organic ring substituted with an air-dryable group; and
  (3) mixtures thereof; and

(C) optionally, a non-emissive, non-flame promoting surface-active agent selected from
  (1) a cationic, non-emissive, non-flame promoting, curable polyhalogenated compound containing an air-dryable group and a cationic surface-active group;
  (2) an anionic, non-emissive, non-flame promoting, curable, polyhalogenated compound containing an air-dryable group and an anionic surface-active group; and
  (3) a nonionic, non-emissive, non-flame promoting polyhalogenated compound containing a nonionic surface-active group;

said coating composition containing at least said solvent (B)(2) or one of said surface-active agents (C)(1) or (C)(2).

4,405,762

PREPARATION OF HYDROXY-TERMINATED POLY(3,3-BISAZIDOMETHYLOXETANES)

Robert A. Earl, and James S. Elmslie, both of Salt Lake City, Utah, assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 7, 1981, Ser. No. 327,825
Int. Cl.³ C08G *65/22, 65/32*
U.S. Cl. 525—410 **22 Claims**

1. A method of making a hydroxy terminated poly(azidomethyloxetane), which comprises:

(a) reacting (i) a 3,3-bishalomethyloxetane with (ii) a polyhydric initiator at a molar ratio of (i) to (ii) of at least about 3:1 in the presence of a strong or Lewis acid catalyst at a polymerization temperature to produce a halomethyl polymer product having a molecular weight between about 500 and 15,000 and a hydroxy number above about 1.5; and

(b) contacting the halomethyl polymer product of (a) and a metal azide at an elevated temperature for a time sufficient to displace a portion of the halide groups of the halomethyl polymer product with azido groups.

4,405,763

THERMOSETTING RESINOUS BINDER COMPOSITIONS, THEIR PREPARATION, AND USE AS COATING MATERIALS

Petrus G. Kooymans; Johannes J. M. H. Wintraecken; Werner T. Raudenbusch; Josepha M. E. Seelen-Kruijssen, and Gerardus C. M. Schreurs, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 99,363, Dec. 3, 1979, Pat. No. 4,332,711. This application Feb. 16, 1982, Ser. No. 349,219
Int. Cl.³ C08L *63/00*
U.S. Cl. 525—438 **7 Claims**

1. A thermosetting binder composition, heatcurable to give an insoluble infusible coating, comprising:

(I) a mixture of:
  (1) a non-acidic polyester prepared by esterifying a polyglycidyl polyether of 2,2-bis(4-hydroxyphenyl) propane with a hydroxy alkane monocarboxylic acid said polyester being essentially free of ethylenic unsaturation, having a molecular weight of at least 900 and a hydroxyl content of at least 0.2 equivalent per 100 g, and
  (2) a non-acidic polyester having an acid number of not more than 10 of a polycarboxylic acid cross-linking agent having more than one β-hydroxyl ester group per molecule, at least one of components (1) and (2) having a hydroxyl functionality of more than 2, and

(II) a transesterification-promoting metal salt or metal complex curing catalyst which is soluble in liquid hydrocarbons.

4,405,764

THERMOSETTABLE POLYESTER RESIN COMPOSITIONS CONTAINING CAPROLACTONE

Michael A. Tobias, Bridgewater, and Conrad L. Lynch, Metuchen, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,816
Int. Cl.³ C08G *63/76*; C08F *283/02*
U.S. Cl. 525—443 **8 Claims**

1. A thermosettable polyester resin composition comprising

A. 25 to 40 weight percent of ethylene glycol, 1,2-propylene glycol, 1,3-butanediol, neopentyl glycol, 1,4-cyclohexanedimethanol, or mixtures thereof;

B. 2 to 8 weight percent of glycerol, trimethylolethane, trimethylolpropane or mixtures thereof;

C. 15 to 25 weight percent epsilon-caprolactone; and

D. 40 to 50 weight percent of a benzenedicarboxylic acid or anhydride thereof.

2. The composition of claim 1 which contains aminoplast cross-linking agent and acid catalyst.

4,405,765

CURABLE EPOXY RESINS

Kurt Demmler, Ludwigshafen, and Wolfram Ochs, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,084

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135636

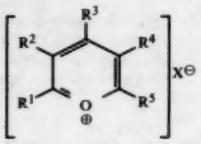
Int. Cl.³ C08G 59/68

U.S. Cl. 525—506 7 Claims

1. A curable resin composition, containing

A. a cationic polymerizable epoxy resin, and

B. from 0.5 to 10% by weight of an onium salt as a hardening catalyst, wherein the catalyst is a pyrylium salt of the formula



(I)

where R^1 and R^5 are identical and are each alkyl or alkaryl, each of 1 to 8 carbon atoms, R^2, R^3 and R^4 are identical or different and are each hydrogen, or alkyl, alkaryl or cycloalkyl, each of not more than 8 carbon atoms, or an unsubstituted or alkyl-substituted phenyl, naphthyl, indenyl, indanyl or fluorenyl group or a heterocyclic substituent containing one or two heteroatoms, and $X^{\ominus}$ is a non-nucleophilic anion.

4,405,766

PHOSPHONIUM BICARBONATE CATALYSTS FOR PROMOTING REACTION OF EPOXIDES WITH CARBOXYLIC ACIDS OR ANHYDRIDES

James L. Bertram, Lake Jackson, Tex.; George A. Doorakian, Bedford, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1982, Ser. No. 403,692

Int. Cl.³ C08G 59/68

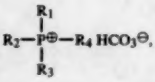
U.S. Cl. 525—507 7 Claims

1. In the process of reacting

(a) a vicinal epoxy-containing material with

(b) carboxylic acid or anhydride

the improvement comprising conducting the reaction in the presence of a catalytic amount of a compound represented by the formula



wherein R_1-R_4 each independently is hydrocarbyl or intertly-substituted hydrocarbyl radical, having from 1 to about 20 carbon atoms.

4,405,767

TREATMENT OF POLY(ARYLENE SULFIDE)

William H. Beever, and Donnie G. Brady, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

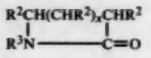
Filed Jun. 22, 1982, Ser. No. 391,067

Int. Cl.³ C08F 285/00

U.S. Cl. 525—537 8 Claims

1. A process for treating a poly(arylene sulfide) polymer comprising:

(a) combining a poly(arylene sulfide) polymer, at least one alkali metal sulfide, and at least one N-alkyl lactam represented by the formula



where each R^2 is selected from the group consisting of hydrogen and R^3, R^3 is an alkyl radical having 1 to 3 carbon atoms, x is an integer of 1 to 3, and the total number of carbon atoms in the N-alkyl lactam is within the range of from about 5 to about 10 under temperature conditions sufficient to react the above ingredients; and

(b) reacting the mixture from step (a) with at least one polyhaloaromatic compound represented by the formula ArX_n where each X is selected from a group consisting of chlorine, bromine, and iodine, n is an integer of 3 to 6 and Ar is a polyvalent aromatic radical of valence n which can have up to about 4 methyl substituents, the total number of carbon atoms in Ar being within the range of about 6 to about 16 such that the molar ratio of the polyhaloaromatic to the poly(arylene sulfide) polymer is in the range from about 0.08:1.0 to about 0.5:1.0 and the mole ratio of the alkali metal sulfide to the polyhaloaromatic compound is in the range from about 1.0:1.0 to about 1.0:1.3, at a temperature in the range from about 100° C. to about 450° C. for about 0.5 to about 10 hours.

4,405,768

POLYMERIZATION PROCESS USING CHROMIUM ON A SUPPORT TREATED WITH TITANIUM POLYMER

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 292,962, Aug. 14, 1981. This application Sep. 24, 1982, Ser. No. 422,780

Int. Cl.³ C08F 4/24

U.S. Cl. 526—96 13 Claims

1. A process comprising:

combining an inorganic support with a titanium polymer, said support having a chromium compound combined therewith either before, during or after said titanium polymer and said support are combined;

activating the resulting support-titanium-chromium composition in an oxygen-containing atmosphere at a temperature within the range of 500°-1000° C., said titanium polymer being present in an amount sufficient to give 2 to 30 weight percent titanium based on the weight of the thus activated composition to produce a catalyst;

contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with said catalyst; and

recovering a polymer.

4,405,769

CATALYST, METHOD OF PRODUCING THE CATALYST, AND POLYMERIZATION PROCESS EMPLOYING THE CATALYST

Charles E. Capshew; James N. Short; M. Bruce Welch, all of Bartlesville, Okla., and Richard E. Dietz, Borger, Tex.

Division of Ser. No. 177,313, Aug. 12, 1980, Pat. No. 4,325,837. This application Feb. 22, 1982, Ser. No. 350,856

Int. Cl.³ C08F 4/02, 10/00

U.S. Cl. 526—119 17 Claims

1. A process for producing a polyolefin comprising contacting at least one polymerizable compound selected from the group consisting of aliphatic mono-1-olefins, conjugated diolefins, and vinyl aromatic compounds under polymerization conditions with a cocatalyst comprising at least one organometallic compound selected from the group consisting of organometallic compounds of Groups I to III of the Periodic Table and a catalyst prepared by

(A) preparing a first catalyst component by reacting in a suitable dry, essentially inert diluent reactants comprising

(1) a metal halide compound selected from the group consisting of metal dihalide compounds and metal hydroxyhalide compounds and the metal of the metal halide compound is selected from the group consisting of Group IIA metals and Group IIB metals of the Mendeleev Periodic Table; and

(2) a transition metal compound in which the transition metal is selected from the group consisting of Group IVB and Group VB transition metals of the Mendeleev Periodic Table and the transition metal is bonded to at least one radical selected from the group consisting of hydrocarbyloxides, amides, imides, and mercaptides; and

(B) reacting a solution of said first catalyst component with a second catalyst component in the presence of an atmosphere of a polymerizable olefin monomer selected from the group consisting of aliphatic mono-1-olefins and conjugated dienes at a pressure in the range of about 1 to about 1,000 psia, wherein the molar ratio of the transition metal compound to the metal halide compound is in the range of about 10:1 to about 1:10, and wherein the concentration of the metal halide in said diluent is in the range of about 0.2 molar to about 1.2 molar, and wherein said second catalyst component comprises a precipitating agent selected from the group consisting of organometallic compounds of Groups I, II, and III selected from the group consisting of lithium alkyls, Grignard reagents, dialkyl magnesium compounds, dialkyl zinc compounds, and hydrocarbyl aluminum halides; metal halides and oxyhalides of metals of Groups IIIA, IVA, IVB, VA, and VB; hydrogen halides; and organic acid halides selected from the group consisting of compounds having the formula

wherein R‴ is an alkyl, aryl, or cycloalkyl group or combinations thereof and X is a halide, and

wherein said precipitating agent is combined with said solution of said first catalyst component in either an undiluted form or as an admixture with a suitable essentially inert diluent, the concentration of said precipitating agent in said diluent being at least 0.2 molar, further wherein said solution of said first catalyst component and said second catalyst component are added together during an addition time of less than about two hours, and then

(C) reacting the solid product resulting from step (B), which optionally has been reacted with a halide ion exchanging source selected from the group consisting of titanium tetrahalides, vanadium oxychloride, and zirconium tetrachloride, with a polymerizable olefin selected from aliphatic mono-1-olefins and conjugated dienes in the presence of an adequate amount of a cocatalyst selected from the group consisting of organometallic compounds of Groups I to III of the Periodic Table to produce a catalyst containing 1 to 50 weight percent prepolymer.

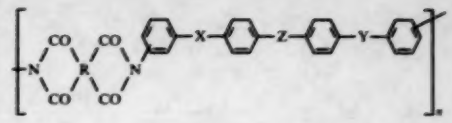
4,405,770

NOVEL POLYIMIDES, AND POLYAMIC ACID AND ESTER INTERMEDIATES THEREOF

Jules E. Schoenberg, Scotch Plains, N.J., and Stephen P. Anderson, South Gate, Calif., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 12, 1981, Ser. No. 292,257
Int. Cl.³ C08G 73/10, 73/12
U.S. Cl. 526—259 **9 Claims**

1. A polyimide resin, consisting essentially of a chain of chain of recurring units of the formula:



wherein R is a tetravalent aliphatic, cycloaliphatic, or aromatic radical; Z is oxygen or sulfur; X and Y are carbonyl or carbinol groups and X and Y may be the same or different; and n is greater than 1.

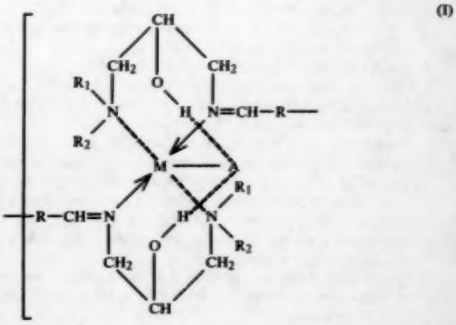
4,405,771

ORGANOMETALLIC POLYMERS, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

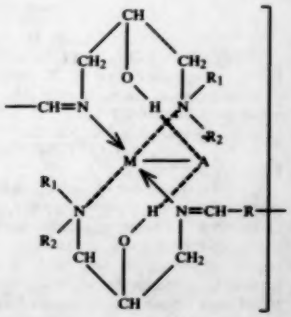
Joseph Jagur, Rehovot, Israel, assignor to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Oct. 16, 1981, Ser. No. 312,319
Claims priority, application Israel, Oct. 27, 1980, 61351
Int. Cl.³ C08G 12/06
U.S. Cl. 528—266 **7 Claims**

1. Polymeric compounds of formulas (I) and (II)

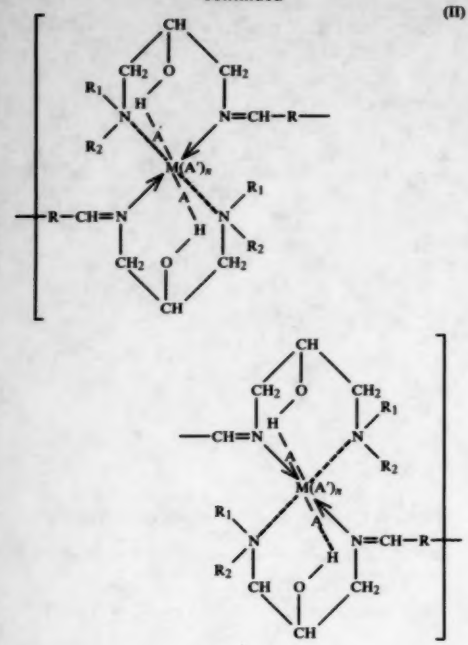


(I)



-continued

(II)



wherein

R designates a bivalent aromatic hydrocarbon group,

R_1 and R_2 designate monovalent hydrocarbon groups,

M is a metal cation capable of forming coordination bonds with imino- and amino-nitrogen atoms,

A and A^1 are anions acting as counter ions of M,

n is zero or an integer depending on the valency of M.

5. A process for the production of polymers of Formula I and II defined in claim 1 which comprises:

a. Condensing an aromatic dialdehyde with a β-hydroxy-α,γ-diamine to form the "monomeric" polydentate ligand;

b. preparing a solution of the "monomeric" polydentate ligand in an organic solvent, preferably an aprotic volatile solvent, such as toluene or chloroform;

c. dissolving a chosen inorganic salt in the "monomeric" polydentate ligand solution;

d. evaporating of the solvent from the thus obtained solution to result in a solid product in the form of a thin layer, powder or flakes.

4,405,772

BUTENE-1-VINYLCYCLOHEXENE COPOLYMER

Pui K. Wong, Katy; Carl L. Willis, and Thomas F. Brownscombe, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 23, 1982, Ser. No. 391,202

Int. Cl.³ C08F *210/08*

U.S. Cl. 526—308 **6 Claims**

1. A solid copolymer of butene-1 and about 0.1 and about 2.0 mole percent 4-vinylcyclohexene, prepared by copolymerizing said butene-1 monomer and said 4-vinylcyclohexene monomer in the presence of a titanium halide coordination catalyst, said copolymer having an initial form II crystalline state which transforms to a stable form I crystalline state, and, as compared to butene-1 homopolymers prepared with identical catalysts, a broader molecular weight distribution, shorter cyrstallization half-time, greater isotacticity as measured by ^{13}C NMR and greater crystallinity as measured by x-ray diffraction.

4,405,773

HYDROPHYLIC CONTACT LENSES AND METHODS FOR MAKING SAME

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 5, 1982, Ser. No. 346,323

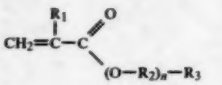
Int. Cl.³ C08F *220/20, 220/28*

U.S. Cl. 526—317 **16 Claims**

1. A hydrophilic contact lens comprising the polymerization reaction product of monomers consisting essentially of by weight on a water-free basis:

(a) 75 to 95 percent hydroxy straight-or-branched-chain C_2–C_4 alkyl monoester of acrylic or methacrylic acid;

(b) 5 to 20 percent monomer having the formula



wherein R_1 is hydrogen or methyl, R_2 is C_2–C_4 straight-or-branched-chain alkylene, R_3 is C_2 to C_4 straight-or-branched-chain alkoxy, and n is 1; and

(c) 0.3 to 4 percent acrylic acid or methacrylic acid, wherein the weight ratio of (b) to (c) is no higher than 25 to 1.

4,405,774

ETHYLENE COPOLYMER

Yukimasa Miwa, Nagoya; Takeo Shimada, Yokkaichi; Shigekazu Hayashi, Yokkaichi; Michito Ukita, Yokkaichi; Hideaki Nakagawa, Suzuka, and Mitsuyuki Matsuura, Kameyama, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,966

Claims priority, application Japan, Dec. 23, 1980, 55-181346

Int. Cl.³ C08F *210/16*

U.S. Cl. 526—348.2 **10 Claims**

1. A copolymer of ethylene and a minor proportion of an α-olefin having 4 to 10 carbon atoms, characterized by having in combination the properties of:

(1) a melt flow rate (MFR) of 0.1 to 100 g/10 min.;

(2) a density of 0.91 to 0.94 g/cm³; and

(3) a xylene absorption per unit amorphous region (Y) satisfying the following formula:

$$Y < -0.80X + 0.67$$

wherein X is the degree of crystallinity of the copolymer.

4,405,775

BIAXIALLY ORIENTED POLYPROPYLENE FILM AND METHOD FOR ITS PRODUCTION

Fukashi Hashimoto, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Japan

Filed Jun. 11, 1981, Ser. No. 272,701

Claims priority, application Japan, Jun. 20, 1980, 55-82713

Int. Cl.³ C08L *23/12*; B29D *7/24*

U.S. Cl. 526—351 **8 Claims**

1. A biaxially oriented polypropylene film, wherein a refractive index Nx of the polypropylene film at a temperature of 20° C. to a longitudinal orientation is no less than 1.5040, while a refractive index Ny of the polypropylene film at the same temperature to a lateral orientation is no less than 1.5120, and the total of the former refractive index and the latter refractive index is at least about 3.023.

3. A method for producing a biaxially oriented polypropylene film, comprising the steps of:

fusing and extruding a sheet of polypropylene;

cooling said sheet to produce a solid sheet;
orienting said sheet in a first longitudinal orientation;
orienting said sheet in at least a second longitudinal orientation without an intervening orientation in a lateral direction;
said first and at least a second longitudinal orientations producing a total longitudinal elongation of from about 4 to about 15 times;
said first longitudinal elongation being from about 50 to about 90 percent of the total longitudinal orientation; and
orienting said sheet in a lateral direction after said first and at least a second longitudinal orientation for a lateral elongation of from about 8 to about 15 times.

4,405,776
POSITIVE RADIATION SENSITIVE RESIST TERPOLYMER FROM OMEGA ALKYNOIC ACID

Thomas R. Pampalone, Belle Mead, and Kurt B. Kilichowski, Mercerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 244,104, Mar. 16, 1981, Pat. No. 4,355,094. This application Jul. 9, 1982, Ser. No. 396,663
Int. Cl.³ C08G 75/22
U.S. Cl. 528—364 **4 Claims**

1. A film forming terpolymer comprising an organic monomer component and sulfur dioxide in a 1:1 molar ratio, said monomer component being comprised of 3-methylcyclopentene, and an omega alkynoic acid represented by the formula

$$CH{\equiv}C{-}(CH_2)_n{-}COOH$$

wherein n is an integer from 1 to 20.

4,405,777
PREPARATION OF A POLYAMIDE FROM LACTAM, AMMONIUM SALT OF UNSATURATED ACID AND UNSATURATED NITRILE

Mu-Yen M. Wu, and Lawrence E. Ball, both of Cuyahoga Falls, Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 219,782, Dec. 24, 1980, abandoned. This application Jul. 14, 1982, Ser. No. 398,178
Int. Cl.³ C08G 69/14
U.S. Cl. 528—323 **11 Claims**

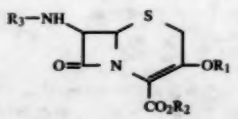
1. A process for producing a solid copolyamide comprising polymerizing an ammonium salt of an alpha,beta-unsaturated carboxylic acid and an alpha,beta-unsaturated nitrile with a lactam.

4,405,778
PROCESS FOR PREPARING CEPHALOSPORIN ETHERS

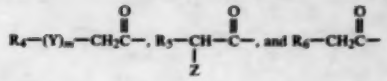
Riccardo Scartazzini, Allschwil, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 373,818, Jun. 26, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,904
Claims priority, application Switzerland, Jun. 29, 1972, 9788; Aug. 17, 1972, 12195; Dec. 22, 1972, 18722; Feb. 23, 1973, 2655
Int. Cl.³ C07D 501/04; A61K 31/545
U.S. Cl. 544—16 **4 Claims**

1. A process for preparing a cephalosporin ether of the formula



wherein
R_1 is C_1-C_4 alkyl;
R_2 is a readily removable ester forming group; and
R_3 is a carboxylic acid acyl residue selected from the group consisting of



wherein
R_4 is phenyl or phenyl substituted by chlorine, bromine, fluorine, iodine hydroxy, nitro, amino, cyano,
Y is O or S, and m is zero or one;
R_5 is R_4, 2-thienyl or 3-thienyl;
Z is protected hydroxy or protected amino;
R_6 is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl or 5-tetrazolyl;
comprising treating a 7-acylamido-3-hydroxy-3-cephem-4-carboxylic acid ester with a non-hydroxylic base selected from the group consisting of alkali metal carbonates or bicarbonates or N-lower alkyl amines,
and a lower alkyl fluorosulfonate in an unreactive organic solvent.

4,405,779
6-(CARBO-T-BUTOXY)-3-MERCAPTO-4-ACETAMINO-1,2,4-TRIAZIN-5-ONES

Richard H. Wiley, 8 Roosevelt Cir., Palo Alto, Calif. 94306

Filed Jul. 9, 1981, Ser. No. 281,699
Int. Cl.³ C07D 253/06
U.S. Cl. 544—182 **3 Claims**

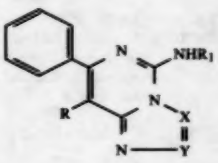
1. 6-(Carbo-t-butoxy)-3-mercapto-4-acetamino-1,2,4-triazin-5-one.

4,405,780
8-SUBSTITUTED 7-PHENYL-1,2,4,-TRIAZOLO[4,3-C]/[2,3-C]PYRIMIDINES-5-AMINES AND AMIDES

Hans Wagner, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 64,707, Aug. 8, 1979, abandoned. This application Feb. 26, 1982, Ser. No. 352,913
Int. Cl.³ C07D 487/04; A61K 31/505
U.S. Cl. 544—263 **11 Claims**

1. A compound of the formula



wherein R is:
(a) hydrogen
(b) alkyl having 1 to 4 carbon atoms;
(c) alkoxyalkyl having 2 to 4 carbon atoms;
(d) alkenyl having 2 to 4 carbon atoms; or
(e) alkynyl having 2 to 4 carbon atoms;
wherein R_1 is
(a) hydrogen
(b) 1-oxoalkyl having 1 to 2 carbon atoms;
wherein X and Y are carbon or nitrogen with the proviso that one of X and Y must be nitrogen and the other carbon.

4,405,781
METHOD FOR PREPARING SALTS OF 6-CHLOROPURINE

Henry Bader, Newton Center, and Yunn H. Chiang, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 238,055
Int. Cl.³ C07D *473/40*
U.S. Cl. 544—264 **12 Claims**

1. A method for preparing a salt of 6-chloropurine and a strong acid comprising the steps of:

(a) reacting hypoxanthine and phosphorus oxychloride in the presence of an organic base to form 6-chloropurine;

(b) adding a solvent for said 6-chloropurine to the reaction mixture obtained in step (a) and reacting said reaction mixture with a strong acid to form a salt of 6-chloropurine and said acid; and

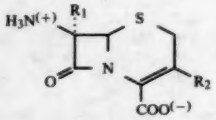
(c) isolating said salt.

4,405,782
PROCESS FOR THE PREPARATION OF SOLUTIONS OF 7-AMINOCEPHALOSPORANIC ACIDS

Alberto Palomo-Coll, and Antonio L. Palomo-Coll, both of Barcelona, Spain, assignors to GEMA, S.A., Spain

Filed Nov. 20, 1981, Ser. No. 323,403
Claims priority, application Spain, Nov. 22, 1980, 497.076; Jul. 16, 1981, 504.011
Int. Cl.³ C07D *501/18*; A61K *31/545*
U.S. Cl. 544—21 **7 Claims**

1. A process for the preparation of solutions of 7-aminocephalosporanic acids which comprises forming a suspension, in an organic non-aqueous solvent, of a compound of the formula

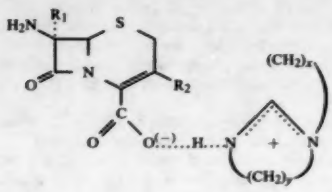


(I)

wherein R_1 is a member of the group consisting of hydrogen, methyl, methoxy, ethoxy, or isopropoxy and R_2 is a member of the group consisting of methyl, methoxy, azido, chloro, carbamoylmethyl, acetoxy, thiomethyl, phenylmethyl, alkylthiocarbonyl, arylthiocarbonyl, methylthiocarbonyl heterocyclic heterocyclic derivative having a five or six member ring with at least one atom of oxygen, sulphur or nitrogen, methylthioheterocycles of thiazole, thiadiazole, triazole, tetrazole, pyridine, pirimidine or of a heterocycle condensed to an aromatic ring, such as thiadiazole, oxadiazole or triazole or a thiadiazolyl, oxadiazolyl or triazolyl radical, is associated by a salt-forming reaction with a bicyclic amidine having the formula:

(II)

where X is from 3 to 5 carbon atoms, to obtain a solution of the corresponding salt of 7-aminocephalosporanic acid having the formula:



(III)

4,405,783
PROCESS FOR THE PRODUCTION OF DIHYDROXYPROPYLTHEOPHYLLINE

Volker Binder, Gelnhausen; Wolfgang Merk, Hanau, and Peter Werle, Gelnhausen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany and Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,464
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133553
Int. Cl.³ C07D *473/08*
U.S. Cl. 544—267 **18 Claims**

1. In a process for the production of pure dihydroxypropyltheophylline by the catalytic reaction of glycidol and theophylline the improvement comprising carrying out the process in the presence of a catalyst which is a hydroxide or short chain alcoholate of an alkali metal or an alkali metal salt of a pseudohydrohalic acid which has a readily polarizable anion, the amount of catalyst being 0.01 to 0.2 mole per mole of theophylline.

4,405,784
METHOD OF MAKING TRIETHYLENEDIAMINE

James E. Wells, Ardmore, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 29, 1981, Ser. No. 278,814
Int. Cl.³ C07D *295/2*
U.S. Cl. 544—352 **9 Claims**

1. In a method for synthesis of triethylenediamine from nitrogen-containing compounds selected from the group consisting of hydroxyethylpiperazine, crude hydroxyethylpiperazine, N-aminoethyl piperazine, ethanolamines and substituted ethanolamines by condensation reactions in the presence of acidic catalyst, the improvement which comprises the use as such catalyst of a product consisting essentially of $SrHPO_4$.

4,405,785
VAT DYESTUFF PREPARED FROM CRUDE ANTHRAQUINONE MIXTURES

Joseph W. Fitzpatrick, and Harold N. Schmidt, both of Toms River, N.J., assignors to Toms River Chemical Corporation, Toms River, N.J.

Continuation of Ser. No. 11,477, Feb. 12, 1979, abandoned, which is a continuation of Ser. No. 808,579, Jun. 21, 1977, abandoned, which is a continuation of Ser. No. 559,451, Mar. 18, 1975, abandoned, which is a division of Ser. No. 346,544, Mar. 30, 1973, Pat. No. 3,917,640. This application Oct. 15, 1980, Ser. No. 197,371
Int. Cl.³ C09B *5/40*
U.S. Cl. 546—30 **3 Claims**

1. A process for manufacturing a vat dyestuff comprising the steps of (1) nitrating athraquinone in the presence of sulfuric acid; (2) reducing the crude nitration product from step (1) to give a crude mixture of aminoanthraquinones which is 65–80% 1-aminoanthraquinone with the rest being a mixture of 2-aminoanthraquinone, 1,5-diaminoanthraquinone and 1,8-diaminoanthraquinone; (3) condensing the crude mixture of

aminoanthraquinones from step (2) with a halogenated benzanthrone; and (4) ring closing the crude condensate of step (3) to give a vat dyestuff which is of substantially the same shade and dyeing strength as a vat dyestuff obtained by condensing the halogenated benzathrone with substantially pure 1-aminoanthraquinone and ring-closing the resulting condensate.

4,405,786

ADDITION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES AND AN DIENOPHILE HAVING ETHYLENE GROUPS

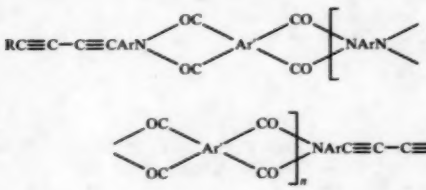
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,608, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,863

Int. Cl.[3] **C07D** *209/34, 471/00;* **C08F** *22/40*

U.S. Cl. 546—66 **20 Claims**

1. The Diels-Alder addition product of (1) a conjugated diacetylene compound of the formula:



wherein:

Ar' is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar' except in the case of Ar' being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical;

n is zero or an integer having a value of one to 20;

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms;

and (2) a dienophile containing one to four acceptor moieties having the formula RCH=C(R°)— wherein R is as defined above and R° is defined as for R.

4,405,787

3-CARBOXY-2-AZABICYCLO[2.2.1]HEPTANE DERIVATIVES

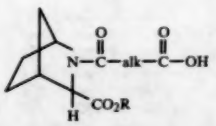
Dimitri Gaitanopoulos, Eagleville, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 5, 1982, Ser. No. 365,139

Int. Cl.[3] **C07D** *487/00*

U.S. Cl. 546—112 **10 Claims**

1. A compound of the formula:

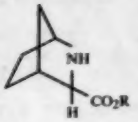


in which:

R is hydrogen, lower alkyl of 1–5 carbons or benzyl; and

alk is an alkylene chain of 2–5 carbons separating the carboxy and carboxamido groups to which it is attached by at least 2 carbons; or a pharmaceutically acceptable alkali metal or organic amine salt thereof.

6. A compound of the formula:



in which R is hydrogen, benzyl or lower alkyl; and its acid addition salts, or, when R is hydrogen, alkali metal or organic amine salts suitable for chemical intermediate use.

4,405,788

BICYCLO NITROGENHETEROCYCLIC SUBSTITUTED SULFOFLUORESCEINS, FLUORESCEINS AND XANTHENES

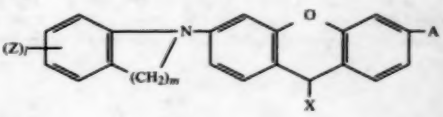
Louis Locatell, Jr., Wellesley Hills; Charles M. Zepp, Boylston, and Ronald F. Ciecinch, Brookline, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 106,898

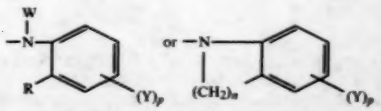
Int. Cl.[3] **C07D** *405/04, 405/14*

U.S. Cl. 546—165 **9 Claims**

1. A compound represented by the formula



where A is



X is H, alkyl having from 1 to 6 carbon atoms, phenyl, naphthyl, phenyl substituted with $CO_2^{\ominus}$, $SO_3^{\ominus}$ or alkyl having from 1 to 6 carbon atoms; or naphthyl substituted with $CO_2^{\ominus}$, $SO_3^{\ominus}$ or alkyl having from 1 to 6 carbon atoms; W is H or alkyl having from 1 to 6 carbon atoms; R is H or alkyl having from 1 to 6 carbon atoms; Z and Y are each H or a monovalent radical selected from the group consisting of $—CH_3$, $—NO_2$, $—SO_3Na$ and $—N(CH_3)_2$; m and n are each integers of from 2 to 6; and l and p are each 1 or 2.

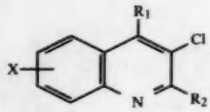
4,405,789

2 PHENYL-3-CHLORO-4[PIPERIDYL ALKYL]QUINOLINES

Alain A. Champseix, Orsay, and Gerard R. Le Fur, Plessis Robinson, both of France, assignors to Pharmindustrie, Gennevilliers, France

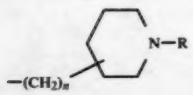
Filed Feb. 24, 1981, Ser. No. 237,784
Claims priority, application France, Mar. 7, 1980, 80 05152
Int. Cl.³ C07D *401/06*; A61K *31/47*
U.S. Cl. 546—176 4 Claims

1. Compounds of the general formula:



(I)

in which X is fixed in positions 5, 6, 7 or 8 of the quinoline ring and represents hydrogen, chlorine, or alkyl or alkoxy having 1 to 4 carbon atoms, one of the substituents R_1 and R_2 is hydrogen, alkyl having 1 to 4 carbon atoms or unsubstituted phenyl, and the other of the substituents R_1 and R_2 is a group of the formula:



in which n is a whole number equal to 1 or 2, R is hydrogen or alkyl having 1 to 4 carbon atoms, and the radical $(CH_2)_n$ is fixed in position 3 or 4 on the piperidine ring, and their pharmaceutically acceptable salts of addition with mineral or organic acids.

4,405,790

PROCESS FOR PREPARING 2-ALKYLAMINO- AND 2-AMINO-5-ALKYLPYRIDINES

Charles K. McGill, and Thomas D. Bailey, both of Indianapolis, Ind., assignors to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Apr. 8, 1982, Ser. No. 366,599
Int. Cl.³ C07D *213/74*
U.S. Cl. 546—304 41 Claims

1. In a substituted Chichibabin amination of a 3-alkylpyridine base in an organic solvent, the improvement comprising a process for improving the ratio of 2,5-:2,3-isomer products of the reaction comprising the step of reacting the 3-alkylpyridine directly with the sodium salt of a primary alkylamine wherein each alkyl group has from 1 to about 20 carbon atoms.

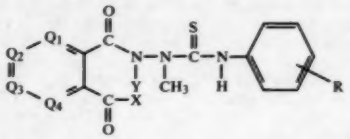
4,405,791

ARYLTHIOUREIDO PYRIDINECARBAMINO COMPOUNDS AND USE AS PLANT GROWTH REGULANTS

Jerry L. Rutter; Charles G. Gibbs, both of Shawnee Mission, and Loren W. Hedrich, Overland Park, all of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1979, Ser. No. 101,654
Int. Cl.³ C07D *213/56*, *213/55*, *213/86*
U.S. Cl. 546—316 40 Claims

1. A compound having the general structural formula



in which one of Q_1, Q_2, Q_3 or Q_4 is N, X is —OH or —O—(C-$_1$–C_4 alkyl) and Y is H or X and Y together represent a bond between carbon and nitrogen atoms and R is H or one or two of the following substituents: —Br, —Cl, —F, —I, —CF_3, —CH_3, —NO_2 or —C≡N.

4,405,792

SUBSTITUTED PYRIDINES AND THEIR PREPARATION

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 8, 1981, Ser. No. 300,046
Int. Cl.³ C07D *213/04*
U.S. Cl. 546—346 9 Claims

1. A process for the preparation of 4-(chlorophenyl)pyridines in which the chlorine atom is in the 3- or 4-position of the phenyl group which comprises reacting a 4-vinyl pyridine with chloroprene to form a 4-(3- or 4-chlorocyclohex-3-enyl)pyridine and then catalytically dehydrogenating the 4-(3- or 4-chlorocyclohex-3-enyl)pyridine to form a 4-(3- or 4-chlorophenyl)pyridine.

5. A process for the preparation of 4(chlorocyclohex-3-enyl)pyridines in which the chlorine is in the 3- or 4-position which comprises heating a 4-vinyl pyridine with chloroprene in an inert solvent to an elevated temperature at which a Diels-Alder type condensation occurs to form a 4-(3- or 4-chlorocyclohex-3-enyl)pyridine.

7. A process for the preparation of 4-(chlorophenyl)pyridines in which the chlorine is in the 3- or 4-position which comprises heating a 4-(3- or 4-chlorocyclohex-3-enyl)pyridine with a palladium catalyst in the presence of a hydrogen acceptor to a dehydrogenation temperature so that a 4-(3- or 4-chlorophenyl)pyridine is formed.

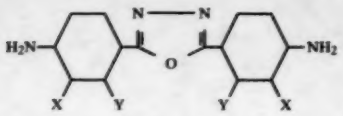
4,405,793

1,3,4-OXADIAZOLES

Otto Fuchs, Frankfurt am Main; Klaus Hunger, Kelkheim; Dieter Weber, Kelkheim, and Reinhard Zunker, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 865,490, Dec. 29, 1977, abandoned.
This application Feb. 1, 1979, Ser. No. 8,394
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659709
Int. Cl.³ C08K *5/23*; C09B *35/34*
U.S. Cl. 548—131 3 Claims

1. A compound of the formula (I)



(I)

wherein one of the substituents X and Y is hydrogen and the other one is chlorine.

4,405,794

PREPARATION OF 2-OXAZOLIDINONE AND ETHYLENEUREA

Robert M. Harnden, Russellville, Ark., and Daniel W. Baugh, Jr., Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1981, Ser. No. 332,290
Int. Cl.³ C07D 263/22, 233/30
U.S. Cl. 548—229 8 Claims

1. A process for making 2-oxazolidinone and ethyleneurea, which comprises the step of reacting urea with beta-hydroxyethylcarbamate at elevated temperatures.

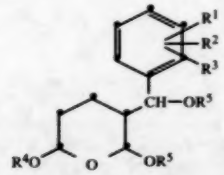
4,405,795

2,6-DIALKOXY-3-(α-ALKOXYBENZYL)TETRAHYDROPYRANS USED AS INTERMEDIATES TO MAKE 2-BENZYLIDENEGLUTARALDEHYDES

Wolfgang Münzenmaier, Wennigsen; Heinz Eggensperger, Hamburg; Helmut H. Ehlers, Hamburg; Wolfgang Beilfuss, Hamburg; Lothar Bücklers, Norderstedt, and Hans-Peter Harke, Hamburg, all of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 294,890, Aug. 21, 1981, Pat. No. 4,371,547.
This application Jun. 7, 1982, Ser. No. 385,522
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032794
Int. Cl.³ C07D 309/06
U.S. Cl. 549—417 10 Claims

1. A 2,6-dialkoxy-3-(α-alkoxybenzyl)tetrahydropyran represented by the formula



where R^1, R^2 and R^3 independently are hydrogen or a substituent selected from the group consisting of halo, lower-alkyl, phenyl, carboxy, lower-alkoxycarbonyl, phenoxycarbonyl, aminocarbonyl, hydroxysulfonyl, nitro, cyano, hydroxy, lower-alkoxy and phenoxy; and R^4 and R^5 independently are alkyl of one to four carbon atoms.

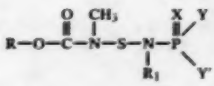
4,405,796

PROCESSES FOR MAKING PHOSPHORUS DERIVATIVES OF AMINOTHIOMETHYLCARBAMATES

Stephen J. Nelson, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

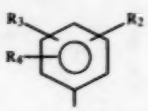
Division of Ser. No. 170,342, Jul. 21, 1980, Pat. No. 4,354,975, which is a continuation of Ser. No. 43,277, Jun. 1, 1979, abandoned. This application Mar. 8, 1982, Ser. No. 355,649
Int. Cl.³ C07F 9/22
U.S. Cl. 549—220 51 Claims

1. A process for preparing a compound having the formula:



I

wherein R is selected from the group consisting of:

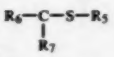


a.

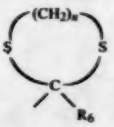
wherein R_2, R_3, and R_4 are the same or different and are selected from the group consisting of hydrogen, lower-alkyl of one to five carbon atoms, inclusive, halogen, lower-alkoxy of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, dialkylamino with each alkyl the same or different and having one to three carbon atoms, inclusive, and $N{=}CHN(CH_3)_2$;

b.

wherein A and B are the same or different and are selected from the group consisting of lower-alkyl of one to five carbon atoms, inclusive, lower-alkylthio of one to five carbon atoms, inclusive, phenylthio wherein phenyl is unsubstituted or substituted with one to three substituents, same or different, selected from the group consisting of halogen and lower-alkyl of one to four carbon atoms, inclusive, monocyano substituted alkylthio of one to five carbon atoms, inclusive, cyano, alkoxy having one to five carbon atoms, inclusive, phenyl, and hydrogen, with the proviso that when A is hydrogen, B is of the formula:



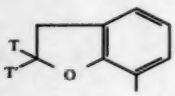
wherein R_5 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and phenyl; R_6 is alkyl of one to three carbon atoms, inclusive; R_7 is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, and SR_8, wherein R_8 is alkyl and is the same alkyl group as R_5, and taking R_5 and R_8 together with the atoms to which they are attached form a dithio heterocyclic of the formula:



wherein n is 2 or 3 and the alkylene portion of the ring is unsubstituted or substituted with one or two methyl groups; A and B taken together with the carbon atoms to which they are attached form a dithio heterocyclic of the formula:

wherein m is 2 or 3 and the alkylene portion of the ring is unsubstituted or substituted with one to two methyl groups; and

c.



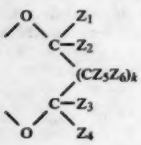
wherein T and T' can be the same or different and are selected from the group consisting of hydrogen and lower alkyl of from one to six carbons; R_1 is selected from the group consisting of lower-alkyl, phenyl, substituted phenyl, phenyl lower-alkyl, and cyclo-alkyl; X is oxygen or sulfur; Y and Y' are the same or different and are selected from the group consisting of:

Y_1 and Y_1' I$_1$

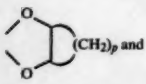
and

Y and Y'

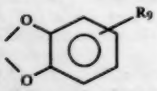
taken together to form a functionality selected from the group consisting of:



I'

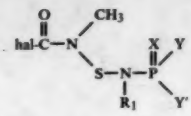


I''



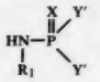
I'''

wherein Y_1 and Y_1' are selected from the group consisting of lower-alkyl, lower-alkoxy, lower-alkylthio, cycloalkyl, phenyl, substituted phenyl, phenoxy, substituted phenoxy, thiophenoxy, and substituted thiophenoxy, Z_1 through Z_6 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl; and k is 0 or 1, p is three or four and R_9 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogen; which comprises step (1) preparing intermediate having the formula



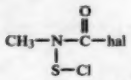
II

in a process wherein a compound having the formula



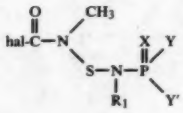
V

is reacted with a compound having the formula



IV

and, step (2) contacting the intermediate



II

wherein R_1, X, Y and Y' are as defined above, and Hal is fluorine or chlorine; with a compound having the formula ROH wherein R is the same as above.

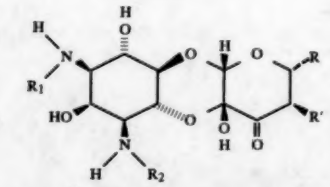
4,405,797

PROCESS FOR PREPARING SPECTINOMYCIN ANALOGS: N-DEMETHYLATION OF SPECTINOMYCIN OR ITS ANALOGS AND REALKYLATION OF THE INTERMEDIATES

Richard C. Thomas, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 16, 1981, Ser. No. 312,035
Int. Cl.[3] C07D *323/04*
U.S. Cl. 549—361 **8 Claims**

1. A process for the preparation of a compound having the formula



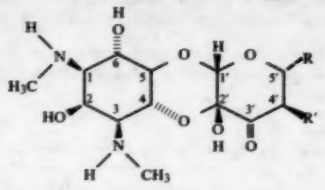
II

wherein R_1 and R_2 may be the same or different such that R_1 and R_2 are both hydrogen, and a mixture such that in one compound of the mixture when R_1 is hydrogen then R_2 is methyl and that in another compound of the mixture when R_2 is hydrogen then R_1 is methyl, and R and R' are the same or different and are hydrogen, alkyl of from C_1 to C_8, inclusive, lower alkenyl, lower haloalkyl, lower aminoalkyl, lower alkynyl, —OX, and $(CH_2)n$—OX

wherein n is an integer of from one to four, and X is lower alkyl, lower alkenyl, benzyl and acyl or pharmacologi-

cally acceptable acid addition salts thereof which comprises:

treating a compound having the formula



I

wherein R and R′ is as defined above, or the pharmacologically acceptable acid addition salts thereof in an aqueous solvent with oxygen in the presence of a catalyst at a temperature between 0° and 100° C. to obtain the product compound II.

4,405,798

ACRYLATE AND METHACRYLATE MONOESTERS OF PENTAERYTHRITOL AND PENTAERYTHRITOL ORTHOESTERS AND POLYMERS AND COPOLYMERS DERIVED THEREFROM

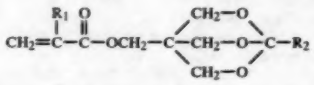
Henry K. Hall, Tucson, Ariz., and Donald R. Wilson, Warren, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 30, 1981, Ser. No. 248,183

Int. Cl.³ C07D *319/14*

U.S. Cl. 549—363 3 Claims

1. An alpha, beta-ethylenically unsaturated orthoester of the general formula



in which R_1 is hydrogen or a methyl group and R_2 is hydrogen or a lower alkyl group.

4,405,799

TREATMENT OF EFFLUENTS CONTAINING DIOXANE

Paritosh M. Chakrabarti, Cedar Grove; Mohamed M. Hashem, and Tom M. H. Cheng, both of Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,740

Int. Cl.³ C07D *319/06, 319/12*

U.S. Cl. 549—369 15 Claims

1. A process for removing dioxane from an alkoxylated product waste gas having a dioxane concentration of up to about 25%, which comprises contacting said gas with an acid having a pK_1 value of not more than 5 at an acid concentration above 50%.

4,405,800

N-ACETYL-PARA-AMINOPHENYL N′-ACETYLAMINO-S-(TETRAHYDRO-2-PYRANYL)THIOALKANOATES

George Margetts, Billingshurst; Roderic S. Andrews, Chapelhouse, both of England, and Jean Legros, Dijon, France, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 246,234, Mar. 23, 1981, Pat. No. 4,361,703, which is a division of Ser. No. 26,329, Apr. 2, 1979, which is a division of Ser. No. 909,846, May 26, 1978, Pat. No. 4,181,719.

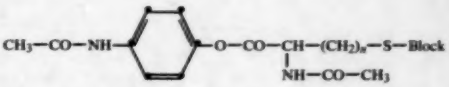
This application Mar. 22, 1982, Ser. No. 360,312

Claims priority, application United Kingdom, May 26, 1977, 22218/77

Int. Cl.³ C07D *309/08*

U.S. Cl. 549—419 1 Claim

1. N-acetyl-para-aminophenyl N′-acetylaminothioalkanoate having the general formula



wherein n is 1 or 2, and "Block" is tetrahydro-2-pyranyl.

4,405,801

SILICON-CONTAINING NITRO DYES AND PROCESS FOR MAKING THE SAME

Bodo Hirsch, Graupa; Gunter Horn, Nuenchritz, and Hellmut Reuther, Dresden, all of German Democratic Rep., assignors to VEB Chemiewerk Nünchritz, Radebeul, German Democratic Rep.

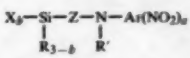
Continuation of Ser. No. 27,266, Apr. 5, 1979, abandoned. This application Jun. 24, 1982, Ser. No. 391,657

Claims priority, application German Democratic Rep., Apr. 5, 1978, 204588

Int. Cl.³ C07F *7/10*

U.S. Cl. 556—422 3 Claims

1. Silicon-containing nitro dyes having the formula:



wherein the coloring component is bonded with the Si-atom by homopolar bonds and wherein X represents same or different hydrolyzable groups or a siloxane radical, Z is a bivalent alkylene radical with 1–10 carbon atoms which may be interrupted by NR′ groups, R is a monovalent organic radical, R′ is hydrogen, alkyl with 1–10 C-atoms, aryl, aralkyl or said substituted radicals, Ar is a substituted or unsubstituted aryl radical, and a and b are integers from 1–3.

4,405,802

CHIRAL BORON ENOLATE REAGENTS

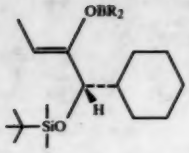
Satoru Masamune, Newton, and William Choy, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 22, 1982, Ser. No. 350,854

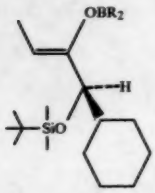
Int. Cl.³ C07F *5/02, 5/04, 5/05, 7/08*

U.S. Cl. 556—402 8 Claims

1. The compound of the formula selected from the group consisting of:



Formula I



Formula II

wherein R is selected from the group consisting of n-butyl and cyclopentyl or R_2B is 9-borobicyclo[3.3.1]non-9-yl.

4,405,803

PROCESS FOR THE PREPARATION OF SILYLISOCYANATES

Rudolf Fauss, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,581

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3122014

Int. Cl.³ C07F 7/10

U.S. Cl. 556—410 **4 Claims**

1. A process for the production of a silylisocyanate of the formula

$$R_aSi(NCO)_bX_c$$

wherein

R represents an aliphatic hydrocarbon group having from 1 to 18 carbon atoms which group may be olefinically unsaturated and/or contain an inert substituent; an aromatic hydrocarbon group having 6 to 18 carbon atoms and optionally containing an inert substituent; an araliphatic hydrocarbon group having 7 to 18 carbon atoms optionally containing an inert substituent; a cycloaliphatic hydrocarbon group having 5 to 18 carbon atoms optionally containing an inert substituent; an alkoxy group having 1 to 18 carbon atoms; or an aryloxy group having 6 to 18 carbon atoms;

X represents chlorine or bromine;

a represents an integer from 1 to 3;

b represents an integer from 1 to 3; and

c represents an integer from 0 to 2

provided that the sum of a+b+c is equal to 4 comprising reacting a halogen silane corresponding to the general formula

$$R_aSiX_{b+c}$$

with urea in a polar solvent at a temperature greater than or equal to 100° C. without application of pressure.

4,405,804

METHOD FOR PREPARING 2-CHLOROETHYLSILANES

Peter John; Reinhold Artes; Volker Frey, all of Burghausen, and Matthias Scherer, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,161

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3144020

Int. Cl.³ C07F 7/08

U.S. Cl. 556—476 **5 Claims**

1. A method for preparing 2-chloroethylsilanes which comprises reacting a vinylchlorosilane with hydrogen chloride in the presence of a catalyst selected from the group consisting of an organoaluminum compound, and the product obtained from the in situ reaction of the organoaluminum compound with at least one of the reactants.

4,405,805

PROCESS FOR RECOVERING AND PURIFYING HERBICIDAL PHENOXYBENZOIC ACID DERIVATIVES

Thomas J. Giacobbe, Skillman, and Grace Tsien, Colonia, both of N.J., assignors to Rhone-Poulenc, Inc., Monmouth Junction, N.J.

Filed Jul. 27, 1981, Ser. No. 286,996

Int. Cl.³ C07C 79/46

U.S. Cl. 560—21 **8 Claims**

1. A process for recovering and purifying acifluorfen or salt thereof in which said acifluorfen or salt is in admixture with one or more isomers thereof and/or one or more other by-products resulting from the process by which said acifluorfen is manufactured, which comprises contacting said acifluorfen or salt with an inert solvent selected from the group consisting of xylene or mixed xylenes which selectively dissolves undesired isomer/other by-product and thereafter separating the acifluorfen or salt from the solution of undesired isomer/other by-product.

4,405,806

BROMINE-CONTAINING 2,4-DIAMINOTRIAZINES

Leon H. Chance, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 276,768, Jun. 24, 1981, Pat. No. 4,352,930. This application Apr. 20, 1982, Ser. No. 370,009

Int. Cl.³ C07C 101/44

U.S. Cl. 560—43 **1 Claim**

1. Ethyl N-(2,4,6-tribromophenyl)glycinate.

4,405,807

TETRAKIS[3-(3,5-DI-T-BUTYL-4-HYDROXYPHENYL)-PROPIONYLOXYMETHYL]METHANE HAVING A NOVEL CRYSTAL STRUCTURE AND PROCESS FOR PRODUCTION THEREOF

Hiroshi Hasui, Tokyo; Toshikazu Furihata, Ichihara; Kazuko Takanashi, Futtsu, and Masahiko Ohmori, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Japan

Filed Jan. 13, 1981, Ser. No. 224,831

Claims priority, application Japan, Jan. 14, 1980, 55-2101; Apr. 1, 1980, 55-41177

Int. Cl.³ C07C 69/76

U.S. Cl. 560—75 **7 Claims**

1. Tetrakis[3-(3,5-di-t-butyl-4-hydroxyphenyl)propionyloxymethyl]-methane having a novel crystal structure characterized by the fact that its X-ray diffraction pattern obtained by X-ray analysis using Cu-K_{60} rays shown a sharp peak at a diffraction angle $2\theta = 10.90°$.

4,405,808

PROCESS FOR PREPARING ACETIC ACID ESTERS

Kazuhisa Nakajima, Minoo; Masahiko Miyashita, Takatsuki; Susumu Hakozaki, Hirakata, and Yoshinori Chosakon, Ibaraki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1982, Ser. No. 370,037

Claims priority, application Japan, Apr. 24, 1981, 56-63086; Apr. 30, 1981, 56-66601

Int. Cl.³ C07C 67/04

U.S. Cl. 560—247 5 Claims

1. A process for preparing an acetic acid ester which comprises reacting acetic acid and an aliphatic lower olefin in vapor phase in the presence of steam on a catalyst selected from the group consisting of an aromatic disulfonic acid and an ester thereof.

4,405,809

PROCESS FOR THE MANUFACTURE OF AROMATIC POLYCARBOXYLIC ACIDS HAVING DELTA Y VALUES BELOW TEN

Eric N. Stech, Mount Pleasant, S.C.; Mark S. Montgomery, Homewood, Ill., and J. Frederick Bates, Mount Pleasant, S.C., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 4, 1981, Ser. No. 327,606

Int. Cl.³ C07C 51/42

U.S. Cl. 562—487 10 Claims

1. In a process for purifying aromatic polycarboxylic acid produced by liquid phase catalytic oxidation of polyalkyl aromatic hydrocarbon to remove undesirable aldehyde aromatic carboxylic acid and other impurities including the step of contacting a water solution of said impure acid and hydrogen gas with a noble metal-containing catalyst; the improvement comprising eliminating any gas phase during the contacting step and conducting said contacting step with said water solution by maintaining hydrogen at about 10 to about 75 percent of saturation in the liquid reaction medium to produce purified aromatic polycarboxylic acid having delta Y values below ten.

4,405,810

7-ARYL-HEPT-5-YNOIC ACIDS AND DERIVATIVES THEREOF

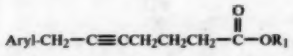
David Blythin, West Caldwell, and Michael J. Green, Skillman, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 14, 1982, Ser. No. 388,060

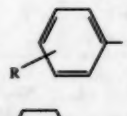
Int. Cl.³ C07C 63/64

U.S. Cl. 562—495 11 Claims

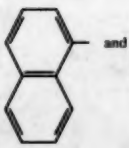
1. A compound of the formula



wherein Aryl is selected from the group consisting of



and



-continued

wherein

R is hydrogen; phenyl; straight- or branched-chain alkyl containing from 1 to 12 carbon atoms; (cycloalkyl)alkyl containing from 3 to 12 carbon atoms; phenoxy; phenyl$(CH_2)_m$—wherein m is 0,1 or 2;

C_nH_{2n+1}—O—CH_2—wherein n is 1–10; or

C_pH_{2p+1}—O— wherein p is 1–12;

R_1 is hydrogen, lower alkyl or phenyl; and the nontoxic pharmaceutically acceptable alkali metal, alkalineearth metal, ethanolamine and N-methylglucamine salts thereof.

4,405,811

SEVERELY STERICALLY HINDERED TERTIARY AMINO COMPOUNDS

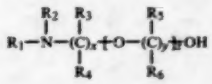
Eugene L. Stogryn, Edison, and Guido Sartori, Linden, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,881

Int. Cl.³ C07C 91/10, 91/12, 93/04, 91/04

U.S. Cl. 564—506 7 Claims

1. A severely sterically hindered tertiary amino compound of the general formula:



wherein R_1 and R_2 are each independently selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms and hydroxyalkyl radicals having 2 to 8 carbon atoms and cycloalkyl and hydroxycycloalkyl radicals having 3 to 8 carbon atoms, R_3, R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen and C_1–C_4 alkyl and hydroxyalkyl radicals, with the proviso that if the carbon atoms of R_1 and R_2 directly attached to the nitrogen atom are primary, both R_3 and R_4 directly bonded to the carbon which is bonded to the nitrogen are alkyl or hydroxyalkyl radicals, and with the proviso that if the carbon atom of R_1 directly attached to the nitrogen atom is secondary and the carbon atom of R_2 directly attached to the nitrogen atom is primary, at least one of R_3 or R_4 directly bonded to the carbon which is bonded to the nitrogen is an alkyl or hydroxyalkyl radical, x and y are each positive integers independently ranging from 2 to 4, and z is either zero or a positive integer ranging from 1 to 4.

4,405,812

PROCESS FOR ORTHO DEALKYLATION OF AROMATIC AMINES

Walter K. Dean, Huntington Woods, and Bernard R. Meltsner, Royal Oak, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 19, 1982, Ser. No. 350,204

Int. Cl.³ C07C 85/24, 85/20

U.S. Cl. 564—409 5 Claims

1. A process for selectively removing an ortho-methyl substituent from an aromatic amine having at least one nuclear methyl substituent ortho to an amine group, said process com-

prising contacting said aromatic amine with a nickel catalyst at an elevated temperature of about 200°–400° C.

4,405,813

PROCESS FOR THE PREPARATION OF 3,5-DIMETHYLANILINE

Rüdiger Berthold, Bad Soden am Taunus, and Werner H. Müller, Eppstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,116

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041899

Int. Cl.³ C07C *85/00, 85/20*

U.S. Cl. 564—415 **10 Claims**

1. A process for the preparation of 3,5-dimethylaniline from 3,5-dimethyl-2-cyclohexen-one azine by heating it in an inert solvent in the presence of a catalyst containing a noble metal of the 8th auxiliary group of the Periqc Table of Elements, wherein the solvent is an aliphatic ether.

4,405,814

HYDROFORMYLATION OF FORMALDEHYDE WITH RHODIUM CATALYSTS

W. Eamon Carroll, Creve Coeur, and Albert S. Chan, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 5, 1981, Ser. No. 290,622

Int. Cl.³ C07C *45/49*

U.S. Cl. 568—462 **11 Claims**

1. A process for the production of glycol aldehyde which comprises reacting carbon monoxide, hydrogen and formaldehyde in a solvent system and in the presence of (1) an amount of a rhodium catalyst sufficient to catalyze the formation of glycol aldehyde and wherein the rhodium catalyst has at least one modifying ligand associated with one rhodium atom and said ligand is a tertiary organo phosphorus moiety or a tertiary organo arsenic moiety or combinations thereof and (2) a basic organo amine composition having a pKa of at least 1.0 serving to improve reaction rate and yield of glycolaldehyde, said process being further characterized in that it is carried out under conditions of elevated pressure not in excess of 6000 psig and elevated temperature in the range of 70° C. up to 150° C., conducive to the formation of glycol aldehyde.

4,405,815

PROCESS FOR THE PRODUCTION OF ACETALDEHYDE AND ETHANOL

Karl-Heinz Keim, Heimerzheim, and Joachim Korff, Bornheim-Sechtem, both of Fed. Rep. of Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,812

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045891

Int. Cl.³ C07C *45/49*

U.S. Cl. 568—487 **6 Claims**

1. In a process for the production of acetaldehyde and ethanol by reacting methanol with hydrogen and carbonmonoxide at elevated temperature and pressure in the presence of a catalyst system containing cobalt, and a promoter selected from the group consisting of iodine, bromine, an iodine compound and a bromine compound and one or more polydentate ligands with donor atoms of the group consisting of phosphorus, arsenic, antimony and bismuth, the improvement which comprises additionally introducing into the catalyst system one or more metals from the group consisting of chromium, molybdenum, tungsten, uranium, titanium, vanadium, iron and nickel.

4,405,816

4,4'-DIPHENYL ETHER-DIALDEHYDE-BIS-DIMETHYLACETAL

Detlef H. Skaletz, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

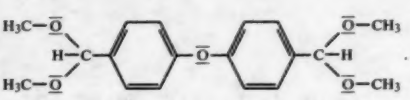
Filed Dec. 21, 1981, Ser. No. 333,013

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048992

Int. Cl.³ C07C *43/263*

U.S. Cl. 568—592 **1 Claim**

1. 4,4'-Diphenyl ether-dialdehyde-bis-dimethylacetal, having the formula



VII

4,405,817

STABILIZED HYDROXYL TERMINATED REACTIVE LIQUID POLYMERS

Walter T. Murphy, Cuyahoga Falls, and Clifford D. Guiley, Jr., Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 30, 1981, Ser. No. 258,979

Int. Cl.³ C07C *29/64, 67/62*

U.S. Cl. 568—701 **3 Claims**

1. Stabilized hydroxyl terminated reactive liquid polymer selected from the group consisting of butadiene polymers and alkyl acrylate polymers containing sufficient amount of an acid with an ionization constant of 1×10^{-4} and greater that inhibits viscosity increase with time.

4,405,818

PRODUCTION OF META-ISOPROPYLPHENOLIC PRODUCTS

George E. Stead, Piscataway, and Lewis B. Young, Skillman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,049

Int. Cl.³ C07C *37/14, 39/06*

U.S. Cl. 568—781 **13 Claims**

1. A process for producing a meta-isopropylphenol-containing product mixture, said process comprising:

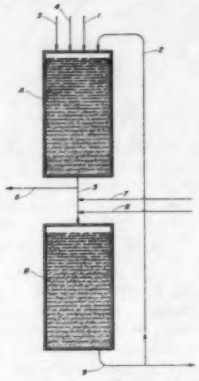
(A) alkylating phenol with an alkylating agent selected from propylene and isopropanol under alkylation conditions which include a temperature of from about 150° C. to 600° C. and a pressure of from about 10^3 N/m^2 to 10^7 N/m^2, to produce an alkylation product comprising isomers of isopropylphenol, and

(B) contacting a mixture containing meta and para isopropylphenol isomers from said alkylation product, with a crystalline zerolite catalyst having a silica-to-alumina molar ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 at a temperature of from about 150° C. to about 600° C. and a pressure of from about 10^4 N/m^2 to 10^6 N/m^2, to thereby selectively crack para-isopropylphenol into phenol and propylene within said mixture and to thereby provide a product mixture enriched in meta-isopropylphenol relative to para-isopropylphenol.

4,405,819
PROCESS FOR THE PRODUCTION OF ALCOHOLS FROM CARBOXYLIC ACIDS

Louis R. Duckwall, Jr., Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed May 3, 1982, Ser. No. 374,212
Int. Cl.³ C07C 29/00
U.S. Cl. 568—814 7 Claims



1. An improved continuous fixed bed acid process for the production of alcohols from carboxylic acids in high yields comprising

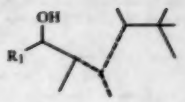
(a) reacting at a temperature of from about 100° C. to about 400° C. and a pressure of from about 1 atmosphere to about 350 atmospheres, carboxylic acids having the general formula RCOOH, wherein R is an alkyl group containing from 1 to 24 carbon atoms and which can contain additional organic acid groups, with alcohols having the general formula R^2OH, wherein R^2 is a linear or branched alkyl containing from 1 to 30 carbon atoms, to produce carboxylic acid esters, then hydrogenating the carboxylic acid esters at a temperature of from about 200° C. to about 350° C. and a pressure of from about 100 atmospheres to about 350 atmospheres with hydrogen and carbon monoxide over a hydrogenation catalyst selected from the group consisting of metallic and metallic oxide compounds of transition elements in subgroup I, subgroup II, subgroup V, subgroup VI and subgroup VIII of the Periodic Table to produce product alcohols, the improvement comprising adding a mixture of hydrogen and carbon monoxide as a sweep gas to the ester formation reaction.

4,405,820
BRANCHED CHAIN OLEFINIC ALCOHOLS, THIOLS, ESTERS AND ETHERS, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PREPARING SAME AND INTERMEDIATES THEREFOR

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 252,334, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Mar. 2, 1982, Ser. No. 354,389
Int. Cl.³ C07C 33/025; A23L 1/226; A24B 3/12; C11D 3/50
U.S. Cl. 568—840 6 Claims

1. At least one compound defined according to the structure:



wherein R_1 is selected from the group consisting of methyl and isopropyl and wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bond.

4,405,821
PROCESS FOR PREPARING GLYCOLALDEHYDE AND/OR ETHYLENE GLYCOL

Richard W. Goetz, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

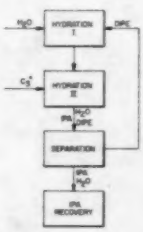
Filed Aug. 11, 1981, Ser. No. 291,749
Int. Cl.³ C07C 29/14, 31/20
U.S. Cl. 568—862 21 Claims

1. In a process in which formaldehyde, carbon monoxide and hydrogen are reacted in a first stage reaction in a non-amide solvent at elevated temperature and superatmospheric pressure in the presence of a catalytic amount of a rhodium-containing catalyst to provide glycolaldehyde, and the glycolaldehyde is subsequently catalytically reduced in a second stage reaction to provide ethylene glycol, the improvement which comprises carrying out said first stage reaction in the presence of a glycolaldehyde yield-enhancing phosphine oxide.

4,405,822
DIISOPROPYL ETHER HYDRATION IN ISOPROPANOL PRODUCTION

Susan A. Bezman, Point Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 30, 1981, Ser. No. 316,580
Int. Cl.³ C07C 29/04
U.S. Cl. 568—899 8 Claims



1. A process for producing isopropanol comprising:

(a) contacting a reactant stream comprising water and diisopropyl ether in a first reaction zone with a first hydration catalyst under hydration conditions including a molar ratio of water to diisopropyl ether of from about 20 to 600;

(b) contacting the effluent from the first reaction zone and a feedstock comprising propylene with a second hydration catalyst comprising an acid ion exchange resin under mixed phase hydration conditions in a second reaction zone including a temperature of from about 275° to 375° C. and a pressure of from about 1000 to 2000 psig;

(c) separating the liquid effluent from the second reaction zone into a product stream comprising water and isopropanol and a recycle stream comprising diisopropyl ether;

(d) passing the recycle stream to step (a); and

(e) recovering isopropanol from the product stream.

4,405,823

PROCESS FOR THE PRODUCTION OF PHENOLS

Takao Maki, Fujisawa; Tetsuo Masuyama, Machida, and Toshiharu Yokoyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,122

Claims priority, application Japan, Aug. 24, 1981, 56-132481; Oct. 7, 1981, 56-159716; Nov. 5, 1981, 56-177582

Int. Cl.[3] C07C *37/56*

U.S. Cl. 568—801 10 Claims

1. A process for producing phenols which comprises contacting benzenemonocarboxylic acids, or their salts, esters, or acid anhydrides with molecular oxygen-containing gas and steam in a liquid phase at a temperature of from 180° to 300° C. and a pressure of from 0.1 to 10 atmospheric pressure in the presence of a copper compound, a manganese compound, and a rare earth element compound.

4,405,824

PROCESS FOR PRODUCING ARYL- OR ARALKYLBENZENE HAVING TWO BENZENE RINGS AT LEAST ONE OF WHICH IS SUBSTITUTED BY AT LEAST ONE 3,3,3-TRIFLUOROPROPYL GROUP

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

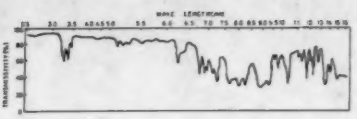
Division of Ser. No. 233,715, Feb. 12, 1981, Pat. No. 4,356,335. This application Feb. 10, 1982, Ser. No. 347,727

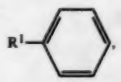
Claims priority, application Japan, Feb. 22, 1980, 55-21090; Feb. 22, 1980, 55-21091; Feb. 22, 1980, 55-21092; Feb. 22, 1980, 55-21093; Feb. 22, 1980, 55-21094; Sep. 1, 1980, 55-120928; Nov. 21, 1980, 55-164434

Int. Cl.[3] C07C *17/32*

U.S. Cl. 570—144 4 Claims

1. A process for producing an aryl- or aralkylbenzene having at least one benzene ring substituted by at least one 3,3,3-trifluoropropyl group, which comprises bringing an aryl- or aralkylbenzene of the formula





wherein R^1 represents phenyl group, benzyl group, phenethyl group or alpha-methylbenzyl group, into reaction with 3,3,3-trifluoropropylene in the presence of an acid catalyst selected from the group consisting of hydrogen fluoride and boron trifluoride.

4,405,825

POUR POINT REDUCTION OF SYNCRUDE

Donald M. Fenton, Anaheim; Dennis D. Delaney, Placentia, and Frank W. Stechmeyer, Irvine, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 30, 1981, Ser. No. 316,893

Int. Cl.[3] C10L *1/22;* F17D *1/16, 1/17;* C10G *29/20*

U.S. Cl. 585—13 19 Claims

1. A syncrude composition having improved pour point characteristics consisting essentially of a syncrude derived from oil shale, tar sands, oil-impregnated diatomite ore or coal and an effective pour point depressant amount of a water-soluble nitrogen-containing compound which has an alkaline pH in aqueous solution selected from the group consisting of ammonia, ammonium hydroxide, and primary, secondary and tertiary aliphatic amines and alkanolamines having one or more alkyl groups containing 1 to 4 carbon atoms.

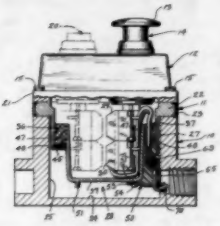
ELECTRICAL

4,405,826

ENCLOSURE SEALING WELL CONSTRUCTION

Gilbert A. Reichert, Greendale, and Richard A. Pankowski, Franklin, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 24, 1981, Ser. No. 305,003
Int. Cl.³ H05K *5/06*
U.S. Cl. 174—59 **10 Claims**



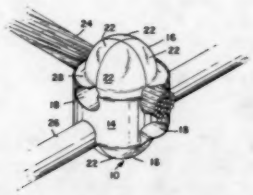
1. In an enclosure including a cup-like base member defining a cavity for receiving an electrical device and having an end wall apertured to receive a first conductive lead, a cup-like sealing well seated within the base member cavity and an enclosure cover including means for supporting said electrical device, a portion of said electrical device being received within the cavity of the sealing well: the combination therewith of a terminal block supported externally of a wall surface of said sealing well and in the space between facing wall surfaces of the sealing well and base member, said terminal block including means for receiving a second conductive lead having one end disposed in the sealing well cavity for electrical connection to the electrical device; detachable connecting means for joining the said first and second conductive leads.

4,405,827

ELECTRICAL CONNECTOR

James L. Mixon, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 22, 1981, Ser. No. 276,306
Int. Cl.³ H01R *4/20*
U.S. Cl. 174—94 R **1 Claim**



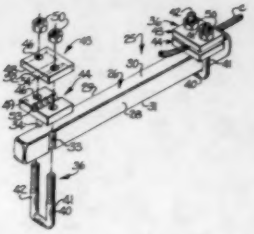
1. An electrical connector for connecting two wires together, comprising an elongated body of conductive material having a midsection and end sections with two circular passages extending through the midsection adjacent each end section with one passage being perpendicular to and intersecting the other passage, and further, slots parallel to and extending from intersection with the passages outwardly through the end sections to define four fingers, said fingers being adapted to be compressed in towards each other and the passages to thereby crimp wires which may be positioned therein.

4,405,828

BREAKING AND INSULATING CLAMP FOR ELECTRICAL CONDUCTORS

David W. Shook, Gastonia, N.C., assignor to Insulating Breaking Clamp, Inc., Mount Holly, N.C.

Filed Mar. 31, 1982, Ser. No. 363,848
Int. Cl.³ H01B *17/00*; H02G *1/02*
U.S. Cl. 174—138 R **13 Claims**



1. A breaking and insulating clamp for tensioned electrical conductors and the like, and which is characterized by the ability to clamp spaced portions of the conductor to permit the severance of the conductor between the spaced portions while maintaining the tensioned condition of the conductor, and comprising

an elongate bar composed of an electrical insulating material having a relatively high tensile strength, said bar defining a longitudinal direction along its length and including shoulder means disposed on the exterior surface thereof at each of two longitudinally spaced apart clamping locations,

clamping means mounted on said bar at each of said spaced apart clamping locations for separately securing a portion of an electrical conductor or the like at each location, each of said clamping means comprising

(a) bolt means having two parallel legs, with said legs straddling said bar and positioned adjacent said shoulder means so as to preclude relative longitudinal movement between the bar and bolt, and with the legs having a length sufficient to extend beyond the surface of the bar,

(b) a pair of cooperating plates each having a pair of apertures, with the apertures of the plates being received on the portions of the legs of the associated bolt means which extend beyond the bar, said plates defining opposing surfaces adapted to receive therebetween an electrical conductor or the like which extends in the longitudinal direction and between the legs of the associated bolt, and

(c) means for clampingly pressing the cooperating plates together so that the plates are adapted to securely retain the electrical conductor or the like extending therebetween.

4,405,829

CRYPTOGRAPHIC COMMUNICATIONS SYSTEM AND METHOD

Ronald L. Rivest, Belmont; Adi Shamir, Cambridge, and Leonard M. Adleman, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 14, 1977, Ser. No. 860,586
Int. Cl.³ H04K *1/00*; H04I *9/04*
U.S. Cl. 178—22.1 **40 Claims**

8. A communications system for transferring a message signal M_i comprising k terminals, wherein each terminal is characterized by an encoding key $E_i=(e_i, n_i)$ and decoding key $D_i=(e_i, n_i)$, where $i=1,2,\ldots,k$, and wherein

M_i corresponds to a number representative of a message signal to be transmitted from the i^{th} terminal,

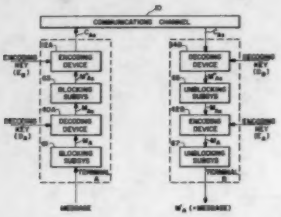
n_i is a composite number of the form

$$n_i=p_i q_i$$

P_i and q_i are prime numbers,
e_i is relatively prime to 1 cm(p_i-1,q_i-1),
d_i is a multiplicative inverse of

$$e_i(\mathrm{mod}(1\ \mathrm{cm}((p_i-1),(q_i-1))))$$

wherein a first terminal includes means for encoding a digital message word signal M_A for transmission from said first terminal (i=A) to a second terminal (i=B), said first terminal including:



means for transforming said message word signal M_A to one or more message block word signals M_A', each block word signal M_A being a number representative of a portion of said message word signal M_A in the range $0 \leqq M_A \leqq n_B-1$, means for transforming each of said message block word signals M_A'' to a ciphertext word signal C_A, C_A corresponding to a number representative of an encoded form of said message block word signal M_A'', whereby:

$$C_A = M_A''^{e_B}(\mathrm{mod}\ n_B).$$

4,405,830

ELIMINATION OF DISPLAY BLANKS RESULTING FROM THE USE OF CHARACTER ATTRIBUTE CODES IN A VIDEOTEX TYPE SYSTEM

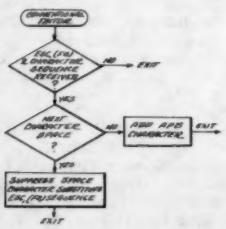
Robert A. L. Foster, Woodbridge, and Geoffrey H. L. Childs, Felixstowe, both of England, assignors to Post Office, London, England

Filed Jul. 1, 1981, Ser. No. 279,514

Claims priority, application United Kingdom, Jul. 3, 1980, 8021817; Oct. 23, 1980, 8034195

Int. Cl.³ H04L *13/16*

U.S. Cl. 178—30 **9 Claims**



1. A videotex type data transmission system comprising:

central information processing and storage means for storing and retrieving coded digital information signals representing display characters and character attributes thereof;

a plurality of remotely situated data displaying terminals, some having split memory character oriented attribute display systems and others having string oriented attribute display systems; and

digital data communication means connecting said central information processing and storage means situated at a central site to said plurality of remotely situated data displaying terminals for selective serial transmission of said coded information signals to said remote terminals;

said central data processing means effecting transmission of a cursor backspace code substantially adjacent a transmitted display control code representing a display character attribute unless the just previous display character is to be followed by a display space thereby permitting successful compatible videotex transmission of the same said coded information signals to the remote terminals having split memory character oriented attribute display systems as well as to the remote terminals having a string oriented attribute display system without requiring a displayed space between changes in displayed character attributes on any remote terminal.

4,405,831

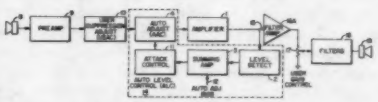
APPARATUS FOR SELECTIVE NOISE SUPPRESSION FOR HEARING AIDS

Robin P. Michelson, Redwood City, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Filed Dec. 22, 1980, Ser. No. 219,342

Int. Cl.³ H04B *15/00;* **H04R** *25/00*

U.S. Cl. 179—1 P **5 Claims**



1. An improved sound amplifying apparatus of the type which includes transducer means for converting sound signals into electrical signals, amplifying means, and means for audibly reproducing electrical signals, wherein the improvement is a selective signal level suppression circuit, the suppression circuit comprising:

manually adjustable attenuating means responsive to electrical signals from the transducer means for selectively attenuating the transducer electrical signals; and

automatic signal level control means, responsive to the attenuated transducer signals and to amplified signals from the amplifying means, for supplying the attenuated transducer signals to the amplifying means for amplification; the automatic signal level control means having means for limiting the level of the attenuated transducer signal which are supplied to the amplifying means to maintain the level of the amplified attenuated transducer signals from the amplifying means at no greater than a predetermined threshold value, whereby adjustment of the attenuation provided by the manually adjustable attenuating means modifies the response of the signal level suppression circuit to the transducer electrical signals by altering the magnitude required in the transducer electrical signals before level limiting of the attenuated transducer signal will occur in the automatic signal level control means.

4,405,832

CIRCUIT FOR DISTORTING AN AUDIO SIGNAL

Jack C. Sondermeyer, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.

Filed May 29, 1981, Ser. No. 268,647

Int. Cl.³ G10H *1/06*

U.S. Cl. 179—1 D **10 Claims**

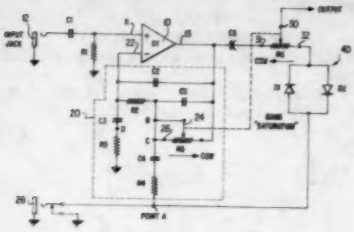
1. A circuit for distorting an input signal comprising

(a) amplifier means for receiving said input signal and producing an output signal,

(b) distortion means having one terminal connected to said output signal for distorting said output signal, and another terminal connected to a switch for selectively connecting said another terminal to a ground voltage or to voltage which substantially equals said output signal,

(c) whereby said distortion means distorts said output signal

when said another terminal is connected to ground and does not distort said output signal when said another



terminal is connected to said voltage which substantially equals said output signal.

4,405,833

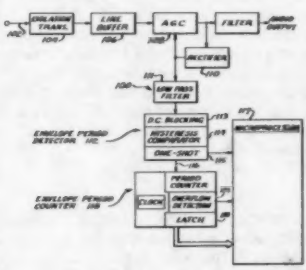
TELEPHONE CALL PROGRESS TONE AND ANSWER IDENTIFICATION CIRCUIT

Ellis K. Cave, and Neil Hazelwood, both of Garland, Tex., assignors to TBS International, Inc., Richardson, Tex.

Filed Jun. 17, 1981, Ser. No. 274,691

Int. Cl.³ H04M *1/26*

U.S. Cl. 179—1 MN **36 Claims**



8. A call progress detector circuit for identifying the progress of telephone calls, including detecting and identifying call progress tones and identifying an apparent answer to the telephone call, comprising:

first means for receiving a telephone signal and for detecting envelope cycles therein; and

identification means responsive to said first means for identifying the progress of a telephone call based on relationships of information about said detected envelope cycles and known telephone call progress tones, said information including the period of said envelope cycles.

26. A method for automatically and electronically identifying the progress of a telephone call on a telephone communication system comprising:

detecting envelope cycles in the telephone signal;

identifying the progress of the telephone call based on relationships of information about said detected envelope cycles and characteristics about known telephone call progress tones, said information including the period of said envelope cycles.

4,405,834

CIRCUIT FOR RECEIVING TWO-TONE/STEREOPHONIC PROGRAMS

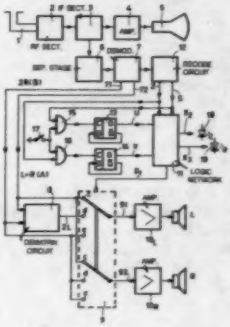
Ulf Buhse, Kollmar, and Henning Schwarz, Reinbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,390

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3036973

Int. Cl.³ H04N *5/60*; H04H *5/00*

U.S. Cl. 179—1 GB **4 Claims**



1. A circuit for use in a receiver which is arranged for receiving two-tone and stereo programs, each program being accompanied by a pilot signal each having a different characteristic frequency, said circuit enabling an operator to select one of the tones for reproduction from a two-tone program or monophonic or stereophonic reproduction from a stereo program, characterized in that said circuit comprises:

means for generating, in the alternative, two characteristic signals from said pilot signals, said means having outputs for respectively providing said characteristic signals;

two bistable multivibrator circuits coupled, respectively, to said generating means outputs,

an operator controllled switch coupled to said bistable multivibrator circuits for changing the state of one of said bistable multivibrator circuits;

means responsive to said characteristic signals and said operator controllable switch for controlling which of said bistable multivibrator circuits changes state:

a logic circuit coupled to the outputs of said bistable multivibrator circuits and said generating means outputs, said logic circuit producing a data word representing the type of program being received and the operator selected form of reproduction; and

automatic switching means controlled by said data word for selecting the desired mode of reproduction.

4,405,835

RECEIVER FOR AM STEREO SIGNALS HAVING A CIRCUIT FOR REDUCING DISTORTION DUE TO OVERMODULATION

Winfried Jansen, Hasloh, and Wolfgang Nolde, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,567

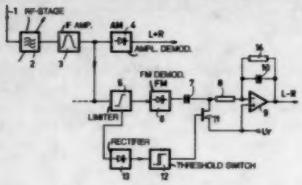
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047386

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GS **3 Claims**

1. A receiver for receiving AM-signals the carrier being amplitude modulated with a first signal (L+R) and phase modulated with a second signal (L−R), said receiver comprising a signal channel having a phase demodulator as well as an

electronic switch for blocking and releasing the signal channel, said electronic switch being controlled by an overmodulation detector, which is energized by an amplitude overmodulation



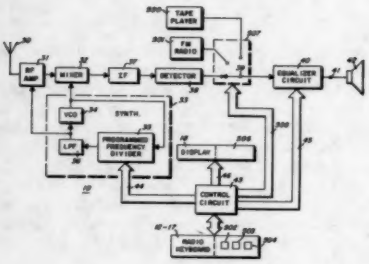
of the carrier, characterized in that said phase demodulator comprises an FM-demodulator and a subsequent integrator, said electronic switch being connected between the FM-demodulator and the integrator.

4,405,836

SIGNAL EQUALIZATION SELECTOR

Jerome D. Meyerhoff, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1982, Ser. No. 336,979
Int. Cl.³ H03G *5/16*
U.S. Cl. 179—1 D **8 Claims**



1. A signal equalization selector comprising:

signal source selector means for selecting a first one of a plurality of signal sources for providing a desired selected signal comprising frequencies within a predetermined frequency band;

equalizer means coupled to said signal source selector means for receiving said selected signal and effectively adjusting the relative emphasis of said selected signal in each of a plurality of subbands within said frequency band, the emphasis of said selected signal in each of said subbands being in accordance with an associated subband equalizer control signal received by said equalizer means for each of said subbands;

memory means for storing at least a first plurality of predetermined control signals and effectively supplying said first plurality of control signals to said equalizer means as said equalizer control signals while said first one of said plurality of signal sources is selected by said signal source selector means;

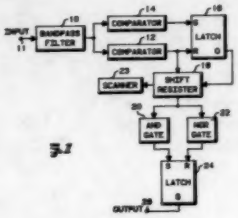
wherein the improvement comprises said memory means storing at least a second plurality of predetermined control signals, and wherein said signal source selector means has structure for selecting a second one of said plurality of signal sources to provide said selected signal and also simultaneously selecting, by selective coupling between said equalizer means and control signals stored in said memory means, said second plurality of control signals, instead of said first plurality of control signals, as said equalizer control signals, whereby equalization for signals derived from said first and second signal sources occurs in accordance with said first and second pluralities of stored control signals, respectively.

4,405,837

TONE DETECTOR CIRCUIT

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1980, Ser. No. 218,878
Int. Cl.³ H04H *5/00*
U.S. Cl. 179—1 GS **16 Claims**



1. Tone detector means comprising:

input means for receiving signals which may include one signal of a predetermined frequency;

filter means coupled to the input means for outputting only those received signals at or near the predetermined frequency;

latching means coupled to the filter means and including comparator means for determining the peak amplitude of each detected cycle, shift register means coupled to the comparator means, and logic means coupled to the shift register means outputs for providing a first output signal only in response to the reception of a first predetermined number of consecutive cycles of said signal frequency, each said cycle having at least a predetermined peak amplitude, and a second output signal only in response to the reception of a second predetermined number of consecutive cycles of said signal frequency having an absolute value less than the predetermined peak amplitude; and

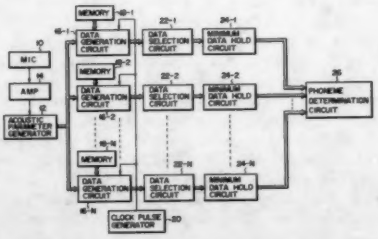
means coupled to the latching means and responsive to the first and second output signals.

4,405,838

PHONEME INFORMATION EXTRACTING APPARATUS

Tsuneo Nitta, Yokohama, and Hideki Kasuya, Utsunomiya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 15, 1981, Ser. No. 273,400
Claims priority, application Japan, Jun. 21, 1980, 55-84207
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SD **13 Claims**



1. A phoneme information extracting apparatus comprising:

memory means in which a plurality of reference acoustic

parameters corresponding to respective reference phonemes are stored;

acoustic parameter generating means for sequentially generating acoustic parameters corresponding to input voice;

similarity data generating means for sequentially generating similarity related to the similarity between the acoustic parameter generated from said acoustic parameter generating means in each of the reference acoustic parameter is read out from said memory means;

checking means for checking whether the received similarity data represents a greater degree of similarity than a predetermined degree of similarity;

data selecting means for successively generating, when it is detected that a predetermined number of successive similarity data regarding the same reference acoustic parameter represent similarity degree greater than said predetermined similarity degree, the successive similarity data for the same reference acoustic parameter which are dealt as effective similarity data; and

phoneme determining means for successively receiving effective similarity data from said data selecting means, holding data representing the maximum similarity degree among the effective similarity data and generating phoneme data representing a reference phoneme corresponding to the similarity data representing the maximum similarity degree.

4,405,839

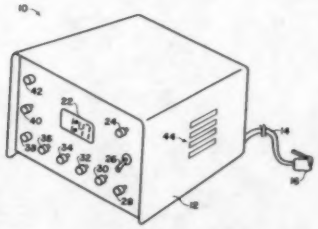
TIMED TELEPHONE RING SILENCER DEVICE

James W. Groff, P.O. Box 38, Morgan Hill, Calif. 95037

Filed Mar. 1, 1982, Ser. No. 353,644

Int. Cl.³ H04M *1/21, 11/02*

U.S. Cl. 179—84 C **4 Claims**



1. A timed telephone ring silencer device for selectively silencing the ringer mechanism of a telphone set for a predetermined timed interval, intended to be connected between a telephone line and a telephone set, said silencer device comprising in combination: a housing equipped with a telephone cord and attached modular plug for connecting said silencer device to a telephone line; timing means for controlling said silencer device, said timing means including a clock, calendar, and alarm mode, the outputs thereof being selectively displayed by an operatively associated alphanumeric readout, said timing means further including sounding means for providing an audible alarm subsequent to a preset timed interval and switch control means for setting said clock, calendar, and alarm modes and for selecting each mode displayed by said alphanumeric readout; a primary power supply for energizing said timing means; a secondary power supply for energizing the remainder of said silencer device; a recharge circuit connected in parallel to said secondary power supply for recharging said secondary power supply; a plurality of switching contacts operatively associated with a first relay coil and a second relay coil of a bistable relay for connecting said secondary power supply to said silencer device and for disabling the ringer mechanism of said telephone set subsequent to energizing said first relay coil, and for disconnecting said secondary power supply from said silencer device and for enabling said ringer mechanism of said telephone set subsequent to energizing said second relay coil; a modular jack operatively connected to said telephone cord and attached modular plug via said plurality of switching contacts for electrically connecting said telephone set to said silencer device; a first manual switching means momentarily connecting said secondary power supply with said first relay coil for connecting said secondary power supply to said silencer device and simultaneously disabling the ringer mechanism of said telephone set when said first relay coil is momentarily energized; a second manual switching means momentarily connecting said secondary power supply with said second relay coil for disconnecting said secondary power supply from said silencer device and simultaneously enabling the ringer mechanism of said telephone set when said second relay coil is momentarily energized; a third manual switching means connecting the alarm mode output of said timing means to either said sounding means, if an alarm function is desired, or to an interface circuit, if timed telephone silencing is desired, the output of said interface circuit being connected to said second relay coil for automatically energizing said second relay coil subsequent to a preset timed interval as controlled by said alarm mode of said timing means; an indicator light connected to said secondary power supply subsequent to energizing said first relay coil for indicating when a timed silent interval is in progress; a voltage comparator and operatively associated voltage divider connected to said secondary power supply for providing an output signal when the voltage of said secondary power supply drops below a predetermined level; and an indicator light connected to the output of said voltage comparator for indicating a low voltage condition.

4,405,840

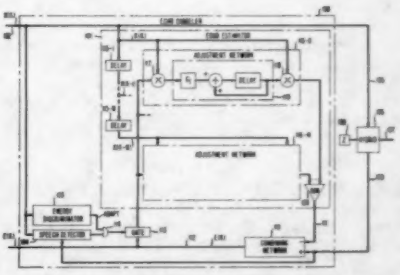
ECHO CANCELER FAR END ENERGY DISCRIMINATOR

Timothy J. Zebo, Marlboro, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 5, 1981, Ser. No. 240,979

Int. Cl.³ H04B *3/24*

U.S. Cl. 179—170.2 **10 Claims**



1. An echo canceler of the type including,

adjustable signal processing means coupled to a first transmission path for generating an echo estimate signal,

means coupled to a second transmission path for combining a signal in the second path with the echo estimate signal to generate an error signal,

means responsive to the error signal for adjusting the processing means, and

means for controllably supplying the error signal to the adjusting means, the echo canceler, CHARACTERIZED BY,

means for discriminating between whole band energy and partial band energy in a received signal in the first transmission path and for generating a control signal indicative thereof,

said discriminating means including

means for generating a first signal representative of an average value of the received signal,

means for generating a second signal representative of a magnitude of the received signal, and

means for comparing said first and second signals to generate a first state of said control signal when said second signal is greater than said first signal, said control signal being supplied to the controllable supplying means for enabling supplying the error signal to the adjusting means during intervals that said control signal first state is generated.

4,405,841

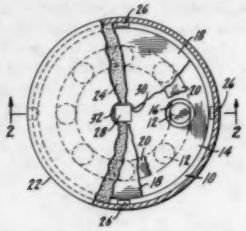
MOVABLE MEMBER MEMBRANE SWITCH

Anthony J. Van Zeeland, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Jul. 23, 1982, Ser. No. 401,075

Int. Cl.³ H01H *19/60, 21/80, 27/04*

U.S. Cl. 200—11 R **5 Claims**



1. A rotary switch using membrane technology including a substrate having annularly arranged contact means thereon, a membrane positioned opposite said substrate and having annularly arranged contact means thereon, a spacer member positioned between and separating said membrane and substrate and having opening means therein registrable with said membrane and substrate contact means, means for applying constant pressure upon said membrane to cause its contact means to move through said spacer opening means to close upon the substrate contact means, and means for causing relative rotation between one or more of said substrate, membrane and spacer to vary the positior. of a membrane and substrate contact means closure.

4,405,842

STEPPING MECHANISM FOR AN ENCODING ROTARY SWITCH

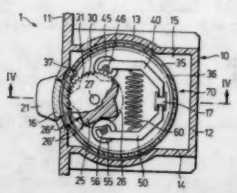
Hans Wermelinger, Rümlang, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Oct. 26, 1981, Ser. No. 314,956

Claims priority, application Switzerland, Nov. 10, 1980, 8314/80

Int. Cl.³ H01H *3/00*

U.S. Cl. 200—17 R **2 Claims**



1. A stepping mechanism for an encoding rotary switch comprising:

a switch housing;

a character wheel rotatably arranged in said switch housing;

an indexing element arranged eccentrically with respect to said character wheel;

a locking device which comprises a locking wheel and two locking levers;

each said locking lever having opposed ends;

one of said ends of each locking lever being mounted in said switch housing and the other end resiliently engaging with said locking wheel;

a first pivot shaft at which there is rotatably mounted said character wheel;

a gear provided with external teeth;

a second pivot shaft at which there is rotatably mounted said gear;

said gear being arranged in spaced relationship from and substantially axially parallel to the character wheel;

said character wheel having internal teeth which mesh with said external teeth of said gear;

said locking wheel being rotatably mounted at said second pivot shaft;

said locking levers being arranged substantially mirror-image symmetrically to opposite sides of the locking wheel;

a respective roller rotatably mounted at said other end of each locking lever;

a single spring secured to both locking levers; and

said single spring acting upon said locking levers for placing the locking levers into engagement by means of said roller with the locking wheel into their latching position and said locking levers being deflectable against the restoring force of said single spring out of their latching position.

4,405,843

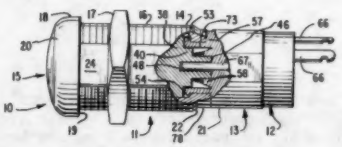
ANTI-STATIC SWITCH LOCK

Stanley C. Wolniak, Chicago; Elbert M. Spencer, Wildwood, and Ronald L. Brown, Waukegan, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Filed Jul. 16, 1981, Ser. No. 283,938

Int. Cl.³ H01H *27/06*

U.S. Cl. 200—44 **5 Claims**



3. In an improved switch lock having a lock with a barrel, a plug extending into one end of the barrel and rotatable therein and a nonconductive hub having resilient mounting legs extending into the other end of the barrel, said legs having outwardly extending surfaces engaging shoulders in the barrel to hold the hub to the barrel, the improvement comprising:

a shaft on said plug axially adjacent to said legs, preventing axial movement of the hub;

a leg support on said plug disposed radially inward of and extending coaxially from said shaft to lie radially adjacent to said legs to prevent radial movement of said legs;

an extension on said shaft disposed radially inward of and projecting coaxially from said leg support;

a seat on the hub between the legs, said seat having a bore to receive a portion of said plug extension; and

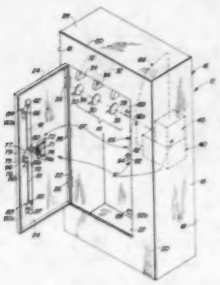
a coil spring to bias the rotation of said plug, said spring surrounding said extension and having one end attached to said extension and the other end bearing against one of said legs, said spring disposed between said leg support and said seat to prevent said spring from engaging said legs or said seat and binding the rotation of said plug.

4,405,844

DOOR INTERLOCK FOR ELECTRICAL APPARATUS

Edmund S. Dizon, Chicago, and Joseph P. Moninski, Jr., Northbrook, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 1, 1982, Ser. No. 364,354
Int. Cl.³ H01H 9/20
U.S. Cl. 200—50 A 14 Claims



1. An improved interlock for electrical apparatus located in a walled enclosure, the interlock being of the type which prevents opening a door of the enclosure if the apparatus is in a first condition and permits opening the door to provide access to the apparatus only if the apparatus is in a second condition, the interlock preventing the apparatus from assuming the first condition when the door is open, wherein the improvement comprises:

latching means movable between a first position, for latching the closed door against opening, and a second position, for unlatching the closed door for opening;

cam follower means movable between a first position, for holding the latching means in its first position, and a second position, for holding the latching means in its second position;

means for biasing the cam follower toward its second position;

locking means operable from the exterior of the enclosure and movable between a first position, for locking the closed door against opening and for holding the cam follower means in its first position, and a second position, for unlocking the closed door for opening and for freeing the cam follower means for movement to its second position by the biasing means, the closed door being openable only if the locking means and the latching means are both in their second positions;

control means movable between a first and a second position, the control means being unable to move out of its first position if the apparatus is not in its second condition and being movable to its second position only if the apparatus is in its second condition;

means for preventing the apparatus from assuming its first condition if the control means is in its second position; and

means interconnecting the control means and the cam follower means for

(a) holding the control means in its first position when the cam follower means is held in its first position,

(b) moving the control means to its second position when the cam follower means moves to its second position and the apparatus is in its second condition, and

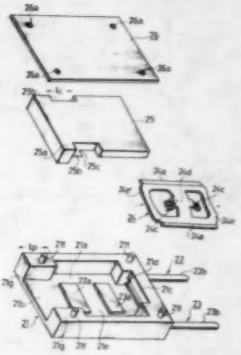
(c) preventing the cam follower means from moving to its second position if the control means is unable to move to its second position.

4,405,845

PUSH-BUTTON SWITCH

Shiro Kondo, Furukawa, and Ken Mizuta, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,422
Claims priority, application Japan, Nov. 8, 1980, 55-159695[U]
Int. Cl.³ H01H 5/18, 13/52
U.S. Cl. 200—67 DB 1 Claim



1. A push-button switch comprising a movable contact piece formed of a resilient and conductive material, said contact piece having a contact portion provided centrally, tongue portions extending away from said contact portion, parallel coupling portions formed on respective sides of said contact portion, and arm portions connecting respective end parts of said coupling portions; a casing having an engaging portion adapted to engage one of said arm portions, stationary contacts fixed in said casing; a slider having a push button portion and an engaging portion adapted to engage the other of said arm portions; and means holding said slider for reciprocal movement in a first direction within said casing so that said coupling portions of said movable contact piece can be inverted in a second direction to bring said tongue portions into engagement with said stationary contacts and control electrical conduction between said contact portion and said stationary contacts upon pressing said push-button portion in said first direction, said coupling portions extending parallel to the direction of movement of said slider and being bent along their longitudinal direction to form a generally V-shaped section.

4,405,846

ARC CHAMBER CHANNEL

Harold E. Belttary, Río Piedras, P.R., assignor to GTE Products Corporation, Stamford, Conn.

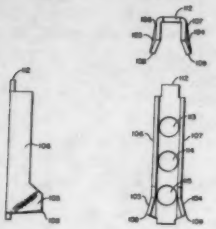
Filed May 6, 1981, Ser. No. 260,857
Int. Cl.³ H01H 33/08, 33/10
U.S. Cl. 200—144 R 4 Claims

1. A channel for providing electric arc cooling and quenching, for use in a circuit breaker, comprising an integral, generally U-shaped member forming a base and opposing side walls from one end to an opposite end,

said one end of said opposing side walls having extending tabs which are folded outwardly, thereby providing a pair of point contacts for engaging side walls of a circuit breaker housing,

said opposite end of said base being formed with an extending tab for engaging a molded feature of a side wall of said

circuit breaker housing, whereby all said extending tabs are adapted to space said channel away from said side



walls of said circuit breaker, thereby exposing outer surfaces of said channel when in use in a circuit breaker, and said base having an arrangement of venting holes therein.

4,405,847

ARC CHUTES

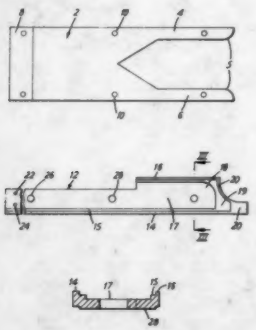
John S. Morton, Wilmslow, England, assignor to Whipp & Bourme (1975) Limited, Lancaster, England

Filed Dec. 15, 1981, Ser. No. 330,808

Claims priority, application United Kingdom, Dec. 23, 1980, 8041216

Int. Cl.³ H01H *33/08*

U.S. Cl. 200—144 R **12 Claims**



1. An arc chute for a circuit breaker including a plurality of arc splitter plates each plate having a pair of spaced parallel limbs merging into a block portion, a pair of spaced apart insulating barriers each barrier containing a row of spaced parallel channels arranged normally into a major longitudinal edge of the barrier each channel encompassing one of the limbs of each of the arc splitter plates, the block portions thereof extending intermediate the barriers, and a pair of arc conductors traversing the block portions of the arc splitter plates adjacent the end portions of the barriers and extending axially in register with respect to each other intermediate the barriers.

4,405,848

ELECTRIC CONTACT ARRANGEMENT

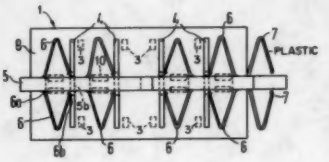
Bruno Jaegle, Petershausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,713

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031725

Int. Cl.³ H01H *1/20*

U.S. Cl. 200—243 **12 Claims**



1. An electric contact arrangement comprising a plurality of movable contact elements and a like plurality of pairs of fixed contact elements, each pair of fixed contact elements being respectively associated with a movable contact element for making and breaking an electrical connection, a slidable carrier having a longitudinally extending centrally disposed bar having a plurality of notches therein for respectively receiving and retaining said movable contact elements for making and breaking with said pairs of fixed contact elements upon actuation of said carrier, a plurality of elastic plastic pressure springs laterally attached to sides of said bar of said carrier and respectively associated with said movable contact elements for biasing said movable contact elements in a direction toward an associated fixed contact element pair, a coverplate having a plurality of recesses therein, and said bar having a plurality of stems extending therefrom receivable in said recesses for retaining said bar against said cover plate.

4,405,849

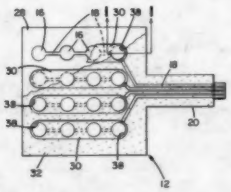
SWITCHING CONTACT

Norman J. Frame, Whitefish Bay, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Mar. 8, 1982, Ser. No. 355,511

Int. Cl.³ H01H *1/02*

U.S. Cl. 200—262 **6 Claims**



1. A multilayered membrane switch comprising a pair of plastic layers carrying pairs of opposing electrically conducting contacts connected to external circuitry by conducting portions on the surfaces of said plastic layers,

a spacer layer between said pair of plastic layers and having openings aligned with said pairs of opposing contacts to normally space said contacts from each other and to permit them to be brought together upon the application of an external force, and

coatings on and extending over said contacts onto adjacent portions of said plastic layers and onto portions of said conducting portions within said openings, said coatings being made of one of $Ti_{2-x}N$ or $Ta_{2-x}N$ material to

reduce oxidation of the surfaces of said contacts and conducting portions, where x is less than or equal to 1.

4,405,850

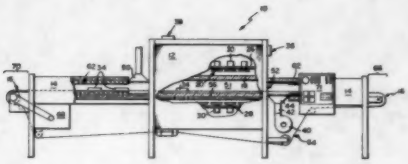
COMBINATION MICROWAVE HEATING APPARATUS

Richard H. Edgar, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 103,262, Dec. 13, 1979, abandoned, which is a continuation of Ser. No. 949,294, Oct. 6, 1978, abandoned. This application Apr. 15, 1981, Ser. No. 254,221

Int. Cl.³ H05B 6/78

U.S. Cl. 219—10.55 A 4 Claims



1. A conveyorized microwave hot air oven, comprising:

a conductive enclosure having entrance and exit openings;

thermally insulating material defining a tunnel from said entrance opening to said exit opening, said material being substantially transparent to microwave energy;

said material being spaced from the walls of said enclosure wherein the volume within said tunnel is substantially less than the volume within said enclosure;

a conveyor system running through said tunnel for transporting objects therethrough;

means for directing heated air under pressure into said tunnel at a first region of said tunnel;

means for exhausting said heated air from a second region of said tunnel; and

a directive microwave radiator positioned within said enclosure but outside said tunnel, said radiator radiating microwave energy toward said microwave transparent tunnel, said energy radiating through said microwave transparent material to heat objects passing through said tunnel on said conveyor system.

4,405,851

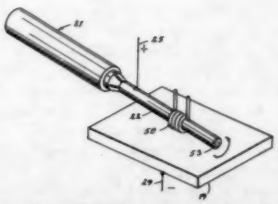
APPARATUS FOR TRANSFER OF METALLIC MATERIALS BY ELECTRIC DISCHARGE

Gary L. Sheldon, Pullman, Wash., assignor to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Jun. 11, 1981, Ser. No. 272,641

Int. Cl.³ B23P 1/18

U.S. Cl. 219—76.13 30 Claims



1. Apparatus for transferring material from one metallic conductor to another metallic conductor by electric discharge deposition, comprising:

a capacitive charging circuit;

switching means connected in the circuit for successively discharging the circuit at a prescribed rate;

wherein one of said conductors is an electrode having a central axis;

said circuit having positive and negative discharge leads operably connected to a source of direct current electrical power, one lead being directly connected to the electrode and the other being adapted for connection to the other conductor, so contact between the electrode and other conductor will complete the circuit when said circuit is being discharged by said switching means; and

powered clamp means for reversibly oscillating the electrode continuously about the central electrode axis through a prescribed arc of less than 360 degrees.

4,405,852

PROCESS FOR DECORATING SPECTACLE FRAMES

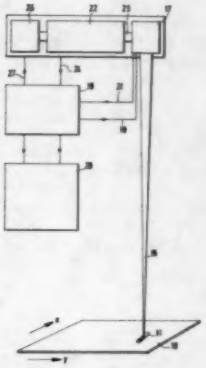
Walter Bononi, Zeppelinstrasse 9, 7012 Feilbach Schmieden, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 248,724

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014361

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LJ 7 Claims



1. A process of decorating spectacle frame parts provided with a metal core having a bright surface, with a jacket of a different material over the core, comprising:

Placing the frame part in the path of a laser beam, the energy of which lies below the energy required to weld the metal and above the energy required to evaporate the jacket, and

Controlling a mirror apparatus in the path of the laser beam, according to the desired course of the decoration, to control the point of impingement of the laser beam on the jacket.

4,405,853

PLASMA SPRAY GUN WITH COOLING FIN NOZZLE AND DEIONIZER

John F. Klein, Port Washington, N.Y., assignor to Metco Inc., Westbury, N.Y.

Filed Aug. 14, 1981, Ser. No. 292,764

Int. Cl.³ B23K 9/00

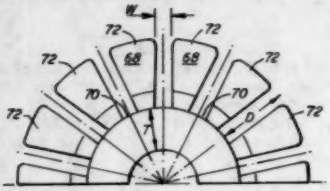
U.S. Cl. 219—121 PP 20 Claims

1. A plasma flame spray gun nozzle comprising, in combination:

an inner member generally cylindrical in shape with a longitudinal axis and defining a passage in which an arc may be formed to create a plasma flame, the arc striking said inner member in an arc striking area on the inner surface of said inner member, said inner member being formed of a material having substantially the same electrical and thermal properties as substantially pure copper;

a plurality of fins on the outer surface of and comprising part of said inner member, each said fin being disposed to form a

slot in a generally longitudinal direction between it and each adjacent fin, each said slot being formed with a slot width at its base in the range of between 0.127 mm and 3.8 mm and a slot depth in the range of between 0.127 mm and 7.6 mm, each said fin having, in the region radially outward of said arc striking area, a base width in the range of between 0.127 mm and 6.35 mm, said inner member having a wall thickness



in the range of between 1.9 mm and 2.8 mm at the base of each said slot; and

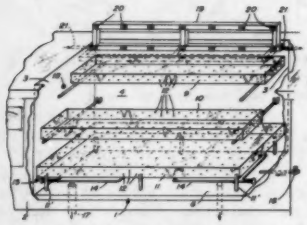
an outer member disposed around said inner member and having an inner surface located not greater than 2.5 mm away from the radially outwardmost surface of each said fin to form a passage between said outer member and said inner member for channeling a coolant.

4,405,854

COMBINED DENTURE MOLD DEWAXER AND CURING BASIN

Denis Lapointe, rue de la Colline - P.O. Box 128, St. Jovite, Canada J0T 2H0

Filed Jun. 18, 1982, Ser. No. 389,985
Int. Cl.³ F27B *14/00*
U.S. Cl. 219—421 **8 Claims**



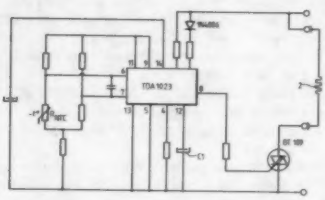
1. An apparatus for dewaxing and curing denture molds, comprising a frame and a basin mounted within said frame, said basin having a pair of spaced end walls, a rear wall, a front wall and a bottom floor wall; said basin adapted to be filled with a liquid; said basin being provided with a first topmost tray mounted on first support means in the upper portion of said basin; a second and a third, middle and lowermost, trays respectively spaced downwardly from said first tray and vertically from each other; second and third support means for said second and third trays respectively; said topmost tray being adapted to support denture flask halves for the dewaxing thereof; further comprising a frame-arm extending across the top portion of said basin and pivotally secured to the latter adjacent the upper rear edge thereof; said frame-arm being of hollow construction and provided with a plurality of shower nozzles adapted to spray liquid over the entire area of said topmost tray; said frame-arm being pivotable between a horizontal spray position and a non-use vertical position; a recirculating pump mounted in said frame and operatively connected to said frame-arm and to said basin; further comprising a heating element located adjacent said floor wall and below said lowermost tray; and a thermostat connected to said heating element to selectively control the temperature of said liquid.

4,405,855

METHOD AND APPARATUS FOR REGULATING THE TEMPERATURE OF A HEATING ELEMENT IN A WATER HEATER

Kjell Kolle, Arnes, and Svein Johannessen, Oslo, both of Norway, assignors to FerroFil A/S, Norway

PCT No. PCT/N080/00013, § 371 Date Dec. 20, 1980, § 102(e) Date Nov. 24, 1980, PCT Pub. No. WO80/02352, PCT Pub. Date Oct. 30, 1980
PCT Filed Apr. 14, 1980, Ser. No. 224,526
Claims priority, application Norway, Apr. 20, 1979, 791325
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—501 **6 Claims**



1. Method for regulating the power which is supplied to a heating element in a water heater, preferably a reservoir water heater containing water which is to be heated to a certain temperature, the supplied power being regulated as a function of the temperature of the water, characterized in that the power which is supplied to the heating element for heating the water, is regulated not only in dependence on the temperature of the water, but also in dependence on the temperature of the heating element, the temperature of the heating element being measured directly and/or indirectly so that

(a) when the temperature of the element is below a certain critical value and the temperature of the water in the water heater is below the rated value, maximum power is supplied to the heating element,

(b) when the temperature of the element has reached the critical value, but the temperature of the water in the water heater is below the rated value, less power than the maximum power is supplied to the element for further heating of the water, so that the temperature of the element is kept below the critical value, and

(c) when the water temperature reaches the rated value, no power is supplied

the critical temperature of the heating element being sensed indirectly by measuring the water temperature, the relation between the temperature of the heating element (T_1) and the water (T_v) being given by

$$T_1 = T_v + P \cdot R$$

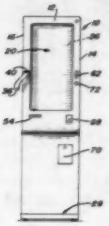
wherein T denotes the water temperature, P supplied power and R thermal resistance between the heating element and the water in the heater.

4,405,856

APPARATUS FOR RECORDING IDENTIFYING DATA CONCERNING THE USE OF A CREDIT CARD, CHEQUE OR THE LIKE

Paul Poisson, Box 121, Rouyn, Quebec, Canada J9X 5C1

Continuation-in-part of Ser. No. 328,709, Dec. 8, 1981, abandoned. This application Nov. 4, 1982, Ser. No. 439,297
Claims priority, application Canada, Feb. 23, 1982, 396858
Int. Cl.³ G06F 7/08
U.S. Cl. 235—381 **28 Claims**



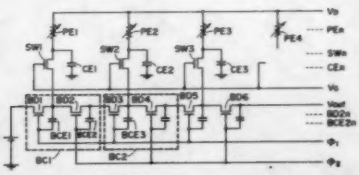
1. An apparatus for recording identifying data relative to the use of a credit card, cheque or like document, comprising:
- a housing;
- a one-way mirror mounted to said housing and disposed in a face viewing relative to the user of said credit card, cheque, or like document;
- camera means mounted in said housing in photographic view of said mirror;
- height indication means in photographic view of said camera means to record indication relative to the height of the user when said camera means are actuated;
- identifying data on the inner side of said mirror in photographic view of said camera means to record information relative to the use of said apparatus when said camera means are actuated;
- means for causing actuation of said camera means; and
- means for dispensing outside said housing a receipt giving information including at least part of said identifying data.

4,405,857

SOLID-STATE PHOTOELECTRIC CONVERTER

Yutaka Hirai, Tokyo; Katsunori Hatanaka, Yokohama; Naoki Ayata, Machida, and Shunichi Uzawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,290
Claims priority, application Japan, Mar. 31, 1980, 55-42203; Mar. 31, 1980, 55-42204; Mar. 31, 1980, 55-42205; Mar. 31, 1980, 55-42206
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 J **12 Claims**



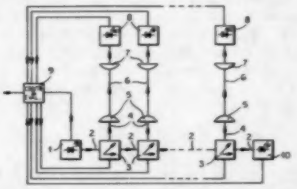
1. A photoelectric converter in solid-state assembly, comprising the following sections juxtaposed integrally on the same substrate:
- a photoelectric converting section constituted of a number of photoelectric converting elements arranged in an array, each element having a light-receiving surface for input of light-information;
- a charge accumulating section constituted of a number of accumulating means, each being provided for each of said photoelectric converting elements, for accumulation of charge signals photoelectrically converted by corresponding photoelectric converting elements;
- a transistor section for transfer constituted of a number of transistors for transfer, each being provided for each of said accumulating means, perform a switching operation for transfer of the signals accumulated in corresponding accumulating means; and
- a BBD transfer section for outputting the signals transferred from each of said accumulating means by arrangement in time series thereof, wherein; said BBD section includes a number of transistors and a number of capacitors; and said photoelectric converting elements, said transistors for transfer and the transistors constituting said BBD transfer section includes thin semiconductor films.

4,405,858

LIGHT GATE WITH CONTROLLED OPTICAL COUPLERS

Hans-Hermann Spratte, Mülheim, Fed. Rep. of Germany, assignor to Krohne Messtechnik GmbH & Co. KG, Duisburg, Fed. Rep. of Germany

PCT No. PCT/EP80/00108, § 371 Date Jun. 12, 1981, § 102(e) Date Jun. 12, 1981, PCT Pub. No. WO81/01200, PCT Pub. Date Apr. 30, 1981
PCT Filed Oct. 10, 1980, Ser. No. 276,373
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941739
Int. Cl.³ G01V 9/04
U.S. Cl. 250—221 **4 Claims**



1. Light gate with a single light source whose light beam can be successively directed by means of a light-distributing unit, energized by a control device, to several optical channels each comprising a light conductor on the transmission side, as well as with a light-receiving device which is coupled with these channels and is followed by an electronic evaluator, characterized by the following features:
- (a) the light-distributing unit comprises a number of directive optical couplers (3) identical with the number of optical channels (6),
- (b) each of the secondary waveguides of the directive optical couplers (3) adjoins a respective light conductor (4) of an optical channel (6),
- (c) the directive optical couplers (3) are disposed via a further light conductor (2) in series with the light source (1) and with one another,
- (d) the electrodes of the directive optical couplers (3) are connected to a control and evaluation device (9) consisting of the control device and the electronic evaluator.

4,405,859

NOMINAL VALUE PICK UP FOR DRIVE CONTROLS

Rudolf Kling, Darmstadt, and Bernd Scheider, Darmstadt-Eberstadt, both of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,403

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3003138

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—229 8 Claims

1. In a drive control for controlling a speed and positions of a drive shaft driven by a drive motor, a combination comprising a control box for the drive motor and having an outside wall, and a nominal value pick up for advancing a nominal speed and a nominal stopping position of the drive shaft, said nominal value pick up being releasably attachable to said outside wall of the control box and provided with an adjustment pin, the nominal value pick up being pivotable on said pin with respect to said control box and being fixedly adjusted thereon in one of a plurality of fixed positions, the nominal value pick up including a housing formed with an internal space, a pull rod device mounted in said space and having a pull rod extended outwardly of said housing, said pull rod being movable by an external force, a connecting cable disposed in said internal space and having a first end extended outside the pull rod device and terminated with a plug connected to the control box and a second end, a plurality of light barrier means on said pull rod device and codeable in accordance with a continuous progression code, conductor means interconnected between said second end of said cable and said light barrier means, and a blinding plate in the region of said light barriers and movable in response to the movement of said pull rod to interrupt said light barrier means.

4,405,860

AUTOMATICALLY CONTROLLABLE LOADING APPARATUS FOR MASS SPECTROMETERS OR THE LIKE

Curt Brunnee; Lothar Delgmann, and Günter Marten, all of Bremen, Fed. Rep. of Germany, assignors to Finnigan Mat GmbH, Bremen, Fed. Rep. of Germany

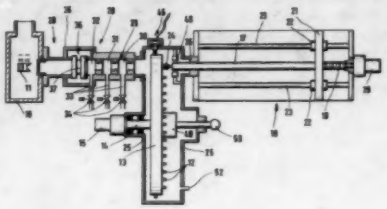
Filed Jan. 19, 1981, Ser. No. 225,828

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002575

Int. Cl.³ H01J *49/26*

U.S. Cl. 250—288 6 Claims

1. Automatically controllable loading apparatus for loading a sample holder carried by a bush rod into a high vacuum chamber of a mass spectrometer, said high vacuum chamber having an entrance channel closed by a valve and having a plurality of aligned stuffing boxes and vacuum chambers arranged in the axis of movement of said push rod comprising: a stationary frame for slidably retaining said push rod with an axis of movement coincident with said stuffing boxes; a disc mounted for rotation on said stationary frame on an axis displaced from but parallel to said axis of movement of said push rod and carrying adjacent its periphery a plurality of removable sample holdes, such holders having a circular locus of movement intersecting said axis of movement of said push rod; said disc also having in place of one of said sample holders a peripheral recess for permitting passage of said push rod



toward said high vacuum chamber; means for rotating said disc to place said peripheral recess in the axis of movement of said push rod; and means for advancing said push rod through said recess and into said entrance channel.

4,405,861

SECONDARY-ELECTRON DETECTOR FOR ANALYZING IRRADIATED SAMPLES FOR SCANNING ELECTRON MICROSCOPES AND MICROPROBES

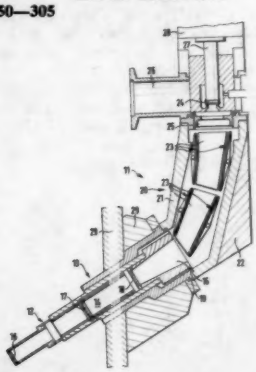
Giancarlo Giacchetti, Karlsruhe; Jürgen Ränsch, Munich, and Clive T. Walker, Karlsruhe, all of Fed. Rep. of Germany, assignors to European Atomic Energy Community (Euratom), Plateau du Kirchberg, Luxembourg

Filed Aug. 20, 1981, Ser. No. 294,674

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1980, 30320139

Int. Cl.³ H01J *40/00*

U.S. Cl. 250—305 6 Claims



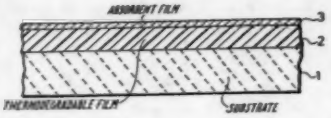
1. A secondary-electron detector for the analysis of irradiated samples for scanning electron microscopes and microprobes, including an electron collector arranged along a curved or angular path, an electron accelerator, a scintillator, a light guide and a photomultiplier, characterized by: an electron spectrometer (20) and a Wehnelt cylinder (25) disposed between the electron accelerator (13) and the scintillator (24).

4,405,862

THERMOSENSITIVE DATA-CARRIER DESIGNED FOR THE RECORDING OF INFORMATION AND A METHOD OF RECORDING INFORMATION ON SUCH A DATA-CARRIER

Claude Bricot; Jean-Claude Dubois; Francois LeCarvennec; Jean-Claude Lehureau, and Henriette Magna, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Continuation of Ser. No. 31,873, Apr. 20, 1979, abandoned, which is a division of Ser. No. 843,508, Oct. 18, 1977, Pat. No. 4,176,277. This application Nov. 30, 1981, Ser. No. 326,025
Claims priority, application France, Oct. 22, 1976, 76 31867
Int. Cl.³ G03C 5/16
U.S. Cl. 250—318 14 Claims



1. A thermosensitive data-carrier for storing information recorded with a concentrated beam of radiation forming an etching spot on said data-carrier, said recorded information being solely generated by causing said etching spot to strike said data carrier at a plurality of points of impact, said data carrier consisting of:

a substrate;

a thermosensitive film of a material which liberates gases by thermal decomposition at a degradation temperature T_1, said thermosensitive film being uniformly affixed to said substrate; and

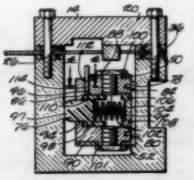
a further film of material, said further film not carrying any of said information prior to any decomposition of said thermosensitive film as a result of heat generated by said radiation and extending over said substrate prior to said decomposition for absorbing radiation of said beam, thereby converting said radiation into heat at said points of impact and selectively diffusing said heat into a portion of said thermosensitive film, for causing said portion to reach said degradation temperature T_1 and creating said decomposition in at least said thermosensitive film in the vicinity of said points of impact.

4,405,863

DETECTOR ARRAY RETAINING AND POSITIONING SYSTEM

Dennis H. Pritzkow, New Berlin; Jack H. Zabel, Milwaukee, and George R. Lang, New Berlin, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 19, 1981, Ser. No. 312,557
Int. Cl.³ G01T 1/18; H01J 1/88
U.S. Cl. 250—385 9 Claims



1. in a multicell radiation detector comprising:

a housing having top, bottom, front, and rear walls and first and second ends defining a chamber for being filled with a gas ionizable by x-rays, said front wall having an x-ray transmissive window;

an array of juxtaposed electrode elements mounted to a pair of frame members for being supported in transversely spaced relation within said chamber to define a multiplicity of adjacent ionization cells; and

mounting means to mount said array between said front and rear walls with said cells opening toward said window and with the front edge of each said element substantially equidistantly spaced from said window to define a uniform, transversely extending gap between said forward edges and said window; improved mounting means comprising:

first and second end blocks interposed between and joined to said frame members to support the respective ends of said array, each end block having front, rear, top, and bottom walls respectively facing the front, rear, top, and bottom walls of said chamber;

a plunger extending from the rear wall of each said end block;

spring means to urge each plunger against the rear wall of said chamber, thereby biasing each end block toward the front wall of said chamber; and

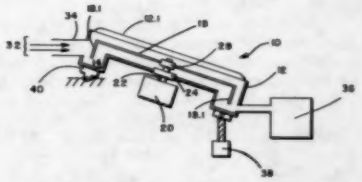
a front spacer positioned between the front wall of each said end block and the front wall of said chamber to maintain said gap.

4,405,864

ION IMPLANTER END PROCESSING STATION

Eddy H. del Rio, Jupiter, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,118
Int. Cl.³ G21K 5/08, 5/10; H01J 37/18, 37/20
U.S. Cl. 250—441.1 4 Claims



1. In an ion implantation system having an evacuation hamber and a carousel, the carousel having provisions for supporting a plurality of substrates around its periphery and rotatably mounted within the chamber to sequentially expose the substrates to a beam of ions to be implanted in the substrate, the substrates supported around the periphery of the carousel substantially perpendicular to the plane of rotation of the carousel, the improvement in the evacuation chamber comprising:

the inner contour of the chamber configured to closely follow both the contour of the carousel and the contour of the perpendicularly disposed substrates; and

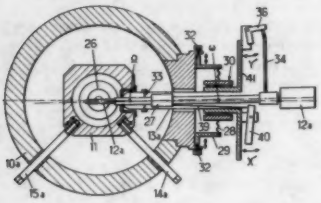
the ratio of the volume of the chamber to the volumetric displacement of the carousel within the chamber being of the order of about 3:1.

4,405,865

DEVICE FOR ADJUSTING THE POSITION AND THE ORIENTATION AROUND AN AXIS OF A SAMPLE HOLDER FOR AN ELECTRON MICROSCOPE

Bernard Genty, Versailles; Alain Marraud, Villebon, and Roger Valle, Clamart, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, France

Filed Aug. 26, 1981, Ser. No. 296,549
Claims priority, application France, Aug. 29, 1980, 80 18836
Int. Cl.³ H01J *37/20*
U.S. Cl. 250—442.1 **7 Claims**



1. In an electron microscope having a column and an internal structure, a device for adjusting the location and angular position of a specimen holder, comprising:

a tube projecting through said column and having a hemispherical end portion resting on a cooperating surface of said internal structure,

means for supporting said tube with respect to said column and for rotating said tube about an orientation axis,

a specimen holder located in said tube and projecting from said tube,

and control means connecting said tube and specimen holders and constructed to adjust said specimen holder in position along the three axes of a reference triad,

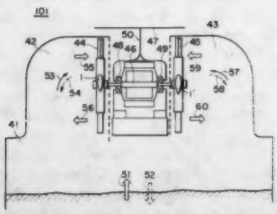
wherein said control means comprises annular diaphragm means connecting said specimen holder and tube and located in proximity to the center of said hemispherical surface, manually actuatable linkage means having two sets of push rods and levers for tilting said specimen holder about the center of said diaphragm means into perpendicular directions.

4,405,866

WAVE-POWER GENERATOR ASSEMBLY

Yoshio Masuda, Yokosuka; Takeaki Miyazaki, Yokohama; Osamu Yamada, Kawasaki, and Akira Hiramoto, Kamakura, all of Japan, assignors to Japan Marine Science; Technology Center and Fuji Electric Company, Ltd., all of, Japan

Filed Oct. 9, 1981, Ser. No. 310,290
Claims priority, application Japan, Oct. 18, 1980, 55-145069
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 **4 Claims**



1. A wave-power generator assembly comprising:

a pair of one-way turbines of the identical structure symmetrically mounted on a common rotating shaft;

bearing means for rotatably supporting said common rotating shaft;

a generator driven to generate electricity by said common rotating shaft;

an air chamber with its bottom opened toward and into the water surface; and

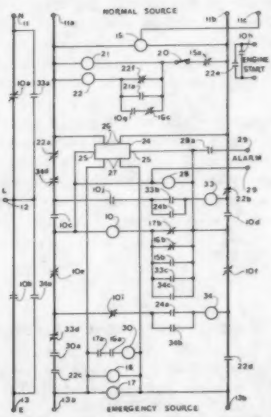
air passage means including first duct means for fluiddynamically connecting said air chamber to the open air through one of said one-way turbines and second duct means for fluiddynamically connecting said air chamber to the open air through the other one-way turbine, whereby the up and down motion of the water surface inside said air chamber causes to direct air flows opposite in direction through said respective one-way turbines in an alternating manner so that the common rotating shaft is driven to rotate in a predetermined direction at all times irrespective of the direction of the air flows through said first and second duct means.

4,405,867

SYSTEM FOR TRANSFERRING A LOAD BETWEEN TWO POWER SOURCES WITHOUT INTERRUPTION OF POWER TO THE LOAD

William A. Moakler, Basking Ridge, and Ralph H. Ringstad, Whippany, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Jan. 23, 1980, Ser. No. 114,521
Int. Cl.³ H02J *3/42*
U.S. Cl. 307—64 **15 Claims**



1. A system for transferring a load from a first AC power source to a second AC power source without interrupting power supply to the load, comprising:

(a) a monitor for sensing both power sources and producing an output signal when the differences between certain characteristics of the two sources are within prescribed limits,

(b) contact means which when closed and open connect and disconnect, respectively, the first AC power source to the load,

(c) contact means which when closed and open connect and disconnect, respectively, the second AC power source to the load, one of said contact means being open and the other closed during steady state operation of the system,

(d) additional contact means connected in parallel with one of said contact means (b) and (c), the additional contact means, when closed, connecting one of the power sources to the load,

(e) means responsive to an output signal from the monitor for closing the additional contact means, and

(f) means responsive to closing of the previously open contact means (b) and (c) and to opening of the previously closed contact means (b) and (c) for opening the additional contact means.

4,405,868

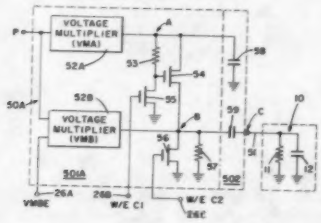
WRITE/RESTORE/ERASE SIGNAL GENERATOR FOR VOLATILE/NON-VOLATILE MEMORY SYSTEM

George C. Lockwood, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 20,123, Mar. 13, 1979, abandoned. This application Jun. 11, 1981, Ser. No. 272,605

Int. Cl.³ H02M *7/537;* **H03K** *5/02;* **H03L** *5/00*

U.S. Cl. 307—296 A **5 Claims**



1. A signal generator for supplying relatively large magnitude pulse signals of opposite polarity to a device having an input terminal with a parallel resistor capacitor circuit, said signal generator being operated by a power supply providing a first polarity voltage of substantially less magnitude than said opposite polarity signals and comprising:

multiplier circuit means couplable to said power supply for multiplying the magnitude of said power supply voltage and supplying said multiplied voltage at a multiplier output terminal;

a first large value capacitor coupled to said multiplier output terminal for storing said multiplied voltage;

a second large value capacitor having one terminal connectable to said input terminal of said device; and

control circuit means responding to control signals on at least one input line for providing, in operating relationship with said multiplier circuit means and said first capacitor, a predetermined sequence of voltages on said second terminal of said second capacitor to produce said pulse signals of opposite polarity during predetermined different time intervals when said first terminal of said second capacitor is connected to said input terminal of said device, a relatively large magnitude pulse of a first polarity being produced when said second capacitor is in a discharged condition and a positive voltage pulse supplied by said first capacitor is applied to said second terminal of said second capacitor, and a relatively large magnitude pulse of an opposite polarity being produced when said second capacitor is in a positively charged condition and a negative going pulse is applied to said second terminal of said second capacitor.

4,405,869

OPTICAL PARAMETRONS

George A. May, R.R. 1, E. Sooke Rd., Sooke, B. C., Canada V0S 1N0

Filed Aug. 27, 1982, Ser. No. 412,178

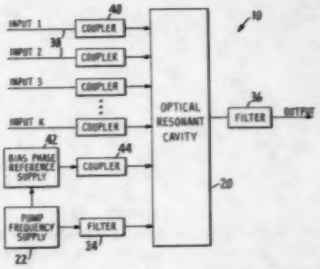
Int. Cl.³ G11C *11/20*

U.S. Cl. 307—405 **6 Claims**

1. An optical gate for performing a logical operation on optical input signals having a frequency f comprising:

pump frequency supply means for generating an optical pump signal having a frequency 2f;

optical resonant cavity means connected to said pump frequency supply means, said cavity means having non-linear optical characteristics such that when said pump signal, received by said cavity means from said supply means has sufficient power, said cavity means will generate a subharmonic output signal having a frequency f, said output signal having one of two possible phases which differ by π radians to one another, said two phases being representative of binary 1 and 0, respectively; and



bias supply means connected to said optical resonant cavity means and generating an optical reference signal having a frequency f, with the power level of said bias signal being adjusted to reflect the type of gate logic desired, whereby any optical input signals supplied to said cavity means are summed with said bias supply signal to produce a resultant seed input signal having one of said two phases, with said one phase being imparted to said output signal from said cavity means.

4,405,870

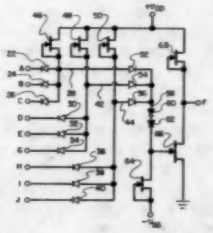
SCHOTTKY DIODE-DIODE FIELD EFFECT TRANSISTOR LOGIC

Richard C. Eden, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 10, 1980, Ser. No. 214,924

Int. Cl.³ H03K *19/094, 19/12, 19/20, 19/017*

U.S. Cl. 307—446 **16 Claims**



1. A logic circuit, comprising:

a plurality of AND logic elements, each AND element including a plurality of Schottky diodes each having an anode and a cathode, with each cathode connected to a logic input and the anodes connected in common to establish an AND output;

a diode pull up connected to each AND output and to a source of positive bias potential to raise the level of said AND output;

an OR logic element, including a plurality of Schottky diodes each having an anode and a cathode, with each anode connected to one of said AND outputs and the cathodes connected in common to establish an OR output;

a first level shifting element connected to said OR output;

a diode pull down connected to said OR output and to a source of negative bias potential to lower the level of said OR output; and

an output field effect transistor having a source, a gate, and a drain, with the gate connected to said first level shifting element, the source connected to ground, and the drain providing a logic output from said circuit.

4,405,871

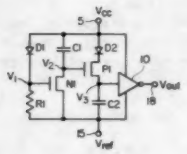
CMOS RESET CIRCUIT

Gerald B. Buurma, and John M. Jorgensen, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 1, 1980, Ser. No. 145,416

Int. Cl.³ H03K *5/153, 17/20, 17/687;* **H02J** *13/00*

U.S. Cl. 307—594 **11 Claims**



1. A CMOS integrated power-on reset circuit for providing an output signal in response to the application of a voltage across a supply terminal and a reference terminal; the circuit comprising:

a first circuit comprising a first capacitor having a first terminal and a second terminal, a first N-channel transistor having a drain coupled to the second terminal of the first capacitor, a source coupled to the reference terminal, and a gate, and first circuit means including a forward-biased diode coupled between the supply and reference terminals in series circuit with the gate and source of the first N-channel transistor;

a second circuit comprising a second capacitor having a first terminal coupled to the reference terminal and a second terminal, a first P-channel transistor having a drain coupled to the second terminal of the second capacitor, a source coupled to the supply terminal, and a gate, and second circuit means including a forward-biased diode coupled between the supply and reference terminals in series circuit with the source of the first P-channel transistor;

inverter means comprising a second P-channel transistor coupled in series circuit with a second N-channel transistor between the supply and reference terminals, the gates of the second transistors coupled, for providing the output signal in response to the voltage applied to the gates of the second transistors;

wherein the second terminal of the capacitor of one of the first and second circuits is coupled to the gate of the transistor of the other of the first and second circuits and the second terminal of the capacitor of the other circuit is coupled to the gates of the second transistors.

4,405,872

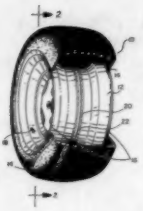
METHOD AND APPARATUS FOR GENERATING ELECTRICAL ENERGY FROM THE ROTATION OF A WHEEL

Stephen E. Thomas, 196 Patricia Way, Grass Valley, Calif. 95945

Continuation-in-part of Ser. No. 940,351, Sep. 7, 1978, abandoned. This application Mar. 2, 1981, Ser. No. 239,624

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—75 R **8 Claims**



1. An apparatus for generating electrical energy from the rotation of a wheel comprising:

an electric generation pair including a means which develops a magnetic flux and another means which, when cut by said lines of magnetic flux due to relative motion between the pair, generates electrical energy;

a non-magnetic support track circumferentially affixed to a non-magnetic wheel rim and within a tire associated with said wheel;

attachment means for attaching a first means of said electric generation pair proximate at least one fixed point of said support track;

means for slidably coupling a second means of said electric generation pair to said support track; and

drag producing means attached to said second means.

4,405,873

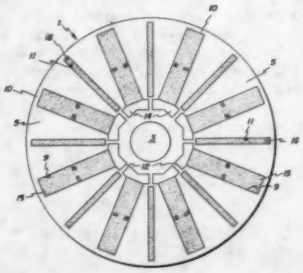
ROTOR FOR A LINE-START PERMANENT-MAGNET MOTOR

Thomas A. Nondahl, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,617

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **10 Claims**



1. A rotor for a self-starting permanent magnet motor comprising:

a shaft;

a cylindrical steel matrix having an aperture extending through the cylinder along its axis for mounting on said shaft, said matrix having a plurality of slots of a first width

extending axially through said matrix and radially spaced about the axis of said matrix, said matrix having a slot of a second width between each pair of circumferentially-successive slots of said first width, said slots of a second width extending axially through said matrix; and

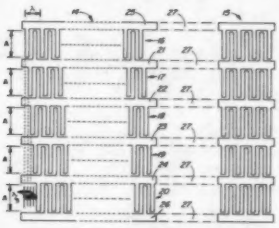
permanent magnet material positioned in said slots, said material in said slots of a first width polarized so that circumferentially-successive faces of said material in said slots of a first width have like polarity, said magnet material in said slots of a second width being sufficiently narrow to be driven completely about its hysterisis loop when said rotor is subjected to a rotating magnetic field in said motor and said rotor is rotating at below synchronous speed, said magnetic material in said slots of a first width being sufficiently wide to retain its polarity when said rotor is subjected to a rotating magnetic field in said motor.

4,405,874

SURFACE ACOUSTIC WAVE (SAW) DEVICES HAVING SERIES-CONNECTED INTER-DIGITAL TRANSDUCERS

Mark S. Suthers, Lanark, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 1, 1982, Ser. No. 353,075
Int. Cl.³ H03H 9/25
U.S. Cl. 310—313 B **8 Claims**



1. A surface acoustic wave device comprising a substrate and two transducer means disposed on a surface of the substrate for propagation of surface acoustic waves therebetween, each transducer means comprising a plurality of inter-digital transducers, electrically connected in series, for operation at a common frequency, wherein each transducer means comprises N inter-digital transducers, the 1st to Nth transducers of the two transducer means being respectively aligned with one another for propagation of N surface acoustic waves between the two transducer means, the transducers of at least one of the transducer means being offset with respect to one another to provide said N surface acoustic waves with N different path lengths between the two transducer means, said path lengths differing from one another to propagate the Nth harmonic of said common frequency between said two transducer means.

4,405,875

HERMETICALLY SEALED FLAT-TYPE PIEZO-ELECTRIC OSCILLATOR ASSEMBLY

Kiyoshi Nagai, 169-1, Nishibori, Urawa-shi, Saitama Prefecture, Japan

Filed Apr. 10, 1981, Ser. No. 253,043
Claims priority, application Japan, Jul. 24, 1980, 55-101686; Aug. 26, 1980, 55-120791[U]; Dec. 28, 1980, 55-185654; Dec. 28, 1980, 55-185655
Int. Cl.³ H01L 41/08
U.S. Cl. 310—344 **28 Claims**

1. A hermetically sealed piezo-electric oscillator assembly comprising:

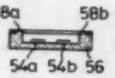
a flat-type package comprising a metal frame and an insulating material portion connected to said metal frame,

said metal frame having an upper surface and an inwardly facing surface portion which faces inwardly of said package;

at least a part of said insulating material portion forming a side wall of said package;

said insulating material side wall having an upper, outwardly facing surface portion which is held in contact with said inwardly facing surface portion of said metal frame;

said inwardly facing surface portion of said metal frame



having an area larger than the area defined by the corresponding upper surface of said metal frame; and

said package including lead wires passing through said insulating material portion to provide terminals inside said package;

a piezo-electric oscillator element mounted inside said package on said terminals; and

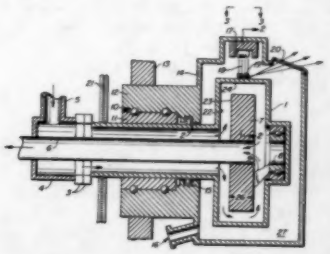
a lid closing the package to encase and hermetically seal said piezo-electric oscillator element inside said package.

4,405,876

LIQUID COOLED ANODE X-RAY TUBES

Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070

Filed Apr. 2, 1981, Ser. No. 250,275
Int. Cl.³ H01J 35/10
U.S. Cl. 313—30 **52 Claims**



1. In x-ray generating apparatus of the type including a rotating anode adapted for irradiation by an energy beam, and including a heat exchange surface on the interior surface thereof, said apparatus including means for providing a flow of coolant liquid to remove heat from said heat exchange surface by formation of nucleate vapor bubbles on said heat exchange surface, said liquid tending to include a viscous sublayer adjacent to said heat exchange surface, the improvement wherein said heat exchange surface includes:

means, disposed on said heat exchange surface, for forming nucleate bubbles or predetermined size and distribution to thereby increase heat flux.

4,405,877

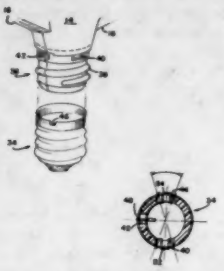
VARIABLY POSITIONAL LAMP HOLDER ASSEMBLY

Thomas Haraden, Ipswich, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 11, 1981, Ser. No. 329,908
Int. Cl.³ H01J 5/48, 5/50
U.S. Cl. 313—318 **6 Claims**

1. A variably positional lamp holder assembly comprising: a housing having a longitudinal extending central body with a

plurality of radial arms attached thereto and transversely projecting therefrom, the terminal ends of said arms remote from said housing being formed to receive and hold a circular fluo-



rescent lamp; said body having a lower portion carrying an electrically conductive base, said base being fixed to said lower portion in a manner to allow a limited amount of rotational movement of said base relative to said lower portion.

4,405,878

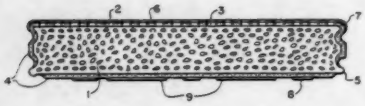
BONDED GRID-CATHODE ELECTRODE STRUCTURE

David W. Oliver, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 149,204, May 12, 1980, abandoned, which is a division of Ser. No. 37,258, May 9, 1979, Pat. No. 4,237,209. This application Oct. 1, 1981, Ser. No. 307,404

Int. Cl.³ H01J *1/14*

U.S. Cl. 313—346 R **9 Claims**



1. A bonded grid-cathode structure comprising a hot thermionic cathode planar structure for operating temperature greater than 1000° C., covered by an insulating layer of boron nitride and that layer covered by a grid layer of molybdenum or tungsten refractory metal, there being identical, aligned openings completely through both grid and insulating layers, the openings having rectangular, elliptical or dog-boned top shape, width of grid openings substantially smaller than two mils, planar aspect ratio of openings at least 10/1 length-to-width, and having grid transparency of at least approximately 70 percent formed by the method of making a bonded grid on a cathode, comprising the steps of:

(a) forming an insulator on said cathode,

(b) forming a metal layer for the grid, on the insulating layer,

(c) forming a photo-resist layer on the metal layer,

(d) exposing the photo-resist layer with means to form a grid pattern, followed by a developing process which selectively removes part of the photo-resist layer to expose openings of said grid pattern,

(e) removing the metal layer in said openings,

(f) using air blasting with an abrasive powder to remove the insulator layer in said openings, with the photo-resist on the metal layer acting as a mask, wherein a special nozzle and scanning provides substantially uniform abrasion over the entire exposed surface of said insulator layer.

4,405,879

PHOTOELECTRIC CONVERSION DEVICE AND METHOD OF PRODUCING THE SAME

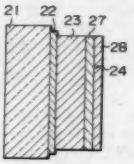
Saburo Ataka, Tokyo; Yoshinori Imamura, Hachioji; Yasuo Tanaka, Kokubunji; Hirokazu Matsubara, Hamuramachi, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,588

Claims priority, application Japan, Mar. 24, 1980, 55-36071

Int. Cl.³ H01J *29/45, 31/38;* B05D *1/36*

U.S. Cl. 313—386 **12 Claims**



1. A photoelectric conversion device comprising a transparent substrate;

a transparent conductive film formed on said substrate;

a photoconductive layer made of amorphous silicon formed on said transparent conductive film; and

a chalcogen glass film formed on said photoconductive layer, wherein

said chalcogen glass film is a composite film comprising at least a first chalcogen glass layer being made of at least one selected from the group consisting of antimony trisulfide and arsenic trisulfide and a second chalcogen glass layer being made of at least one selected from the group consisting of antimony trisulfide, arsenic trisulfide, antimony triselenide and arsenic triselenide, said first chalcogen glass layer is formed in a lower pressure atmosphere and said second chalcogen gas layer is formed in a higher pressure atmosphere.

4,405,880

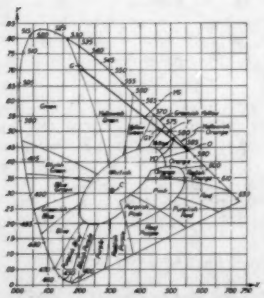
DATA DISPLAY CRT HAVING A YELLOW-EMITTING SCREEN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,610

Int. Cl.³ H01J *31/00*

U.S. Cl. 313—467 **5 Claims**



1. A monochrome data display cathode ray tube having means for forming and directing an electron beam to impinge a cathodoluminescent screen disposed on the viewing area and constituted of a bright substantially yellow-emitting screen

component evidencing medium-long image persistence and capable of exhibiting a selected hue substantially defined by C.I.E. color coordinates within the range substantially delineated by "x" 0.505, "y" 0.475 and "x" 0.410, "y" 0.545, said screen component being formed of a discrete blend of phosphors comprising:

a medium-long persistence green-emitting phosphor evidencing an excited hue substantially defined by C.I.E. color coordinates having an "x" value in the order of 0.210 ± 0.010 and a "y" value of substantially 0.700 ± 0.010; said green emitting phosphor is a zinc orthosilicate host co-activated with manganese and arsenic (Zn_2SiO_4:Mn:As); and

a medium-long persistence orange-emitting phosphor evidencing an excited hue substantially defined by an "x" value in the order of 0.550 ± 0.010 and a "y" value of substantially 0.440 ± 0.010, said orange-emitting phosphor is a cadmium silicate host co-activated with manganese and arsenic ($CdSiO_3$:Mn:As).

4,405,881

COLOR CATHODE RAY TUBE INCLUDING Nd_2O_3 AND Cr_2O_3 IN FACE GLASS

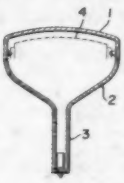
Hiroo Kobayashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,678

Claims priority, application Japan, May 29, 1980, 55/72382; Aug. 28, 1980, 55/119983

Int. Cl.³ H01J *29/86*

U.S. Cl. 313—480 **7 Claims**



1. In a color cathode ray tube comprising a fluorescent screen having at least one phosphor on an inner surface of the face glass for plural color emission, the improvement comprising:

incorporating 0.3 to 1.5 wt% per 10 mm glass thickness, of Nd_2O_3 and a small amount of the colorant Cr_2O_3 and optionally other colorants in said face glass to impart wavelength selectivity to said face glass.

4,405,882

AIR FLOW SENSOR

Stephen J. Reinsch, Vista, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 8, 1980, Ser. No. 213,986

Int. Cl.³ H01J *61/52*

U.S. Cl. 315—118 **2 Claims**

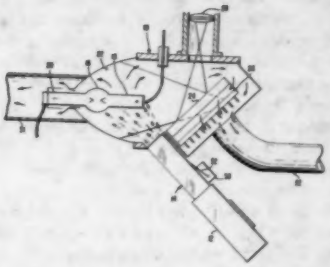
1. An air flow sensor comprising:

walls defining a duct having an inlet end and an outlet end for passing air therethrough from said inlet end to said outlet end, a blower connected to said inlet end of said duct to blow air therethrough and a lamp housing connected to said outlet end of said duct, said lamp housing having a lamp therein;

an opening in the wall of said duct said wall having said opening therein being substantially planar, said opening being vented away from said duct;

a vane pivoted in said duct on said wall having an opening therein adjacent the upsteam end of said opening, said vane having a first position wherein said vane lies against said wall on the interior of said duct to be unobstructive to air flow through said duct, said vane being configured to cover said opening when in said first position so that pressure in said duct holds said vane in said first position, said vane having a second position wherein said vane uncovers said opening and extends into said duct;

means for urging said vane from said first position toward said second position; and



means for detecting when said vane is in said first position so as to signal air flow through said duct, said detecting means comprising an electric switch connected to be actuated by said vane when said vane is in its first position, said switch being connected to said lamp to prevent energization of said lamp when said vane is away from said first position to prevent energization of said lamp in the absence of sufficient air flow to hold said vane in said first position.

4,405,883

APPARATUS FOR STOPPING ROTATION OF TAPE REELS

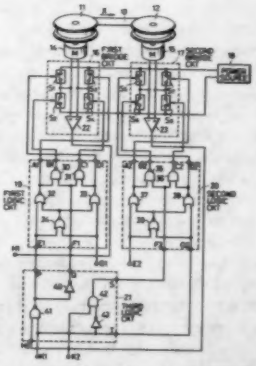
Kazutaka Ashida, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 29, 1981, Ser. No. 287,985

Claims priority, application Japan, Jul. 30, 1980, 55-108006

Int. Cl.³ H01J *9/395*

U.S. Cl. 318—6 **3 Claims**



1. An apparatus for stopping rotation of tape reels, said apparatus having a first motor for rotationally driving a first tape reel, a second motor for rotationally driving a second tape reel, and a control circuit means for controlling the rotation of the motors by independently controlling the rotation of the first and second motors, and for stopping the first and second tape reels after a recording medium in a tape form has been fed

from the first tape reel and taken up by the second tape reel, said control circuit means comprising:

first bridge circuit means having four switches which respectively form four sides of said first bridge circuit, the contiguous sides of said bridge joining each other at four apexes, said first motor having motor terminals respectively connected between one pair of opposing apexes of the first bridge circuit;

second bridge circuit means having four switches which respectively form four sides of said second bridge circuit, the contiguous sides of said bridge joining each other at four apexes, said second motor having its motor terminals respectively connected between one pair of opposing apexes of the second bridge circuit;

first terminal means having at least three terminals for receiving input digital signals;

first logic circuit means having outputs connected to said first bridge circuit means and being responsive to said input digital signals from the first terminal means for producing digital signals from four output terminals in response to said input digital signals supplied to said three input terminals of said first terminal means, to independently switch ON or OFF each of the four switches of said first bridge circuit;

second terminal means having at least three terminals for receiving input digital signals;

second logic circuit means having outputs connected to said second bridge circuit means and being responsive to said input digital signals from the second terminal means for producing digital signals from four output terminals in response to said input digital signals supplied to said three input terminals of said second terminal means, to independently switch ON or OFF each of the four switches of said second bridge circuit;

comparator means having a digital output signal and being coupled to terminals of said second motor for comparing the voltage difference therebetween; and

third logic circuit means responsive to said output digital signal of said comparator which compares the voltage difference between motor terminals of said second motor, a train of pulses for controlling the rotational speed or the rotational torque of said second motor, and a digital signal indicating a rotation mode or a stop mode, respectively,

said third logic circuit means producing and supplying output digital signals to said first and second logic circuit means in response to the digital signal indicating the rotation mode supplied thereto, to control said first and second logic circuit means so that the motor terminals of said first motor are released, and so that a train of pulses is applied to the motor terminals of said second motor so that said second tape reel takes up said recording medium of a tape form,

said third logic circuit means producing and supplying output digital signals to said first and second logic circuit means in response to the digital signal indicating the stop mode supplied thereto, to control said first and second logic circuit means so that a voltage is applied to the motor terminals of said first motor to obstruct said second tape reel from taking up said recording medium of a tape form, and so that after the motor terminals of said second motor are released, the motor terminals of said first and second motors are respectively disconnected to release said first and second motors when said comparator detects that a counter electromotive voltage generated by said second motor is zero.

4,405,884

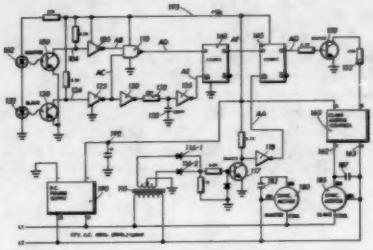
SHAFT POSITION SYNCHRONIZATION MEANS FOR MULTIPLE SYNCHRONOUS INDUCTION MOTORS

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Apr. 27, 1981, Ser. No. 257,575

Int. Cl.³ G05B *19/28*

U.S. Cl. 318—85 **31 Claims**



1. Motor shaft angle synchronization method effective to produce a state of relative angular coincidence between the rotating shaft positions of a master and at least one slave alternating current induction motor operating from a common frequency power signal, through the combination of:

a. operating all said induction motors from the common frequency power signal thereby substantially locking the relative rotational rates therebetween;

b. receiving a leading shaft position signal from the master;

c. receiving a following shaft position signal from each slave;

d. adapting the leading signal in combination with each following signal to effectively produce a control signal from each combination that is superimposed upon the relatively constant frequency said power signal exciting each slave motor thereby serving to intermittently retard the normal substantially synchronous shaft speed of the correspondent slave to bring about sufficient slippage of the instant shaft position of the slave relative to the master to produce angular coincidence therebetween; and,

e. inhibiting said control signal retardation effect when angular coincidence between the master and the slave is achieved.

4,405,885

BRUSHLESS DC MOTOR

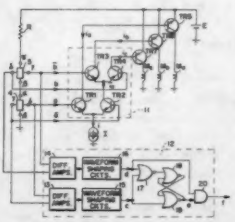
Hiroshi Okamoto, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 20, 1981, Ser. No. 284,531

Claims priority, application Japan, Jul. 23, 1980, 55-101615; Oct. 17, 1980, 55-146165

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—254 **6 Claims**



1. A brushless dc motor comprising a rotor including a permanent magnet of 2n-poles (n: an integer), a stator including three-phase stator windings, a position signal generator for generating a position signal corresponding to a rotating posi-

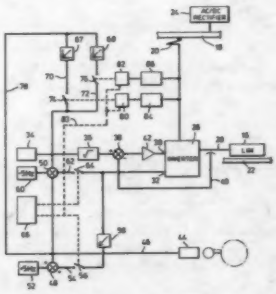
tion of said rotor, and a current divider for controlling a period of time for energizing said three-phase stator windings according to said position signal, wherein said position signal generator comprises a position detecting rotary member, a first position detecting element, a second position detecting element, and a position detecting means, said position detecting rotary member being provided with a first position detecting track which is ring-like in shape and which has two states, A and B, which are different in physical properties and which are coded sequentially at an angular ratio of approximately 1 to 2 corresponding to the number of the polarities of said permanent magnet and being provided with a second position detecting track which is ring-like in shape and which has two states which are different in physical properties and which are coded sequentially at a different angular position from said first position detecting track, and rotating integrally with said rotor, said first position detecting element detecting said coded physical state of said first position detecting track corresponding to a rotating position of said position detecting rotary member, said second position detecting element detecting said coded physical state of said second position detecting track, said position detecting means providing a coding ratio of said two coded physical states of said second position detecting track and mounting said second position detecting element, so that within a zone where said first position detecting element detects the physical state A, said physical state detected by said second position detecting element changes an odd number of times and at a substantially central angle of an angular width in which said first position detecting element detects said physical state B, and said physical state detected by said first position detecting element changes once.

4,405,886

BRAKING CONTROL

Dennis F. Williamson, 850 Ludgate Crescent, Kingston, Ontario, Canada K7M 6C8

Filed Feb. 25, 1981, Ser. No. 238,076
Int. Cl.³ H02P 3/18
U.S. Cl. 318—376 **9 Claims**



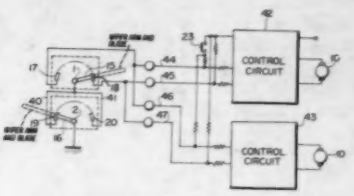
1. A regenerative braking system comprising an electric induction motor, an external conductor connected to said motor to transfer power between said motor and a source, sensing means to sense the voltage in said external conductor, and control means to control the regenerative capacity of said motor, said control means being operable to increase the slip frequency between the synchronous frequency of said motor and the control frequency supplied to said motor to reduce said regenerative capacity upon said sensing means sensing a predetermined voltage in said conductor and thereby reduce the power delivered by said motor to the conductor.

4,405,887

DRIVE CIRCUIT FOR A WIPER DEVICE

Takeo Tamura, Yokohama; Hiroshi Hara, Funabashi, and Takayoshi Kido, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,362
Claims priority, application Japan, Oct. 13, 1980, 55-141968
Int. Cl.³ H02P 1/04
U.S. Cl. 318—443 **33 Claims**



1. A wiper device for an automotive vehicle comprising:
first and second wiper assemblies having wiper blades and wiper arms respectively;
first and second reversible driving motors connected with said first and second wiper assemblies for driving said first and second wiper assemblies in first and second directions alternately, said first and second driving motors being adapted to be simultaneously driven in the same directions with respect to each other;
a first drive control circuit associated with said first driving motor for controlling the driving direction of said first driving motor;
a second drive control circuit associated with said second driving motor for controlling the driving direction of said second driving motor;
first and second switch means, incorporated in said first and second drive control circuits for switching direction of current supplied to each of said first and second driving motor for reversing the driving directions of said driving motor; and
first and second end detectors for detecting given motion ends of said first and second wiper assemblies in said first and second directions, said first and second end detectors being coupled with each other so that there is derived a switching signal for switching said first and second switch means of said first and second drive control circuits between a first position for driving said first and second driving motors in said first direction and a second position for driving said first and second driving motors in said second direction, said switching signal being derived when both of said first and second detectors detect the motion ends of said first and second wiper assemblies.

4,405,888

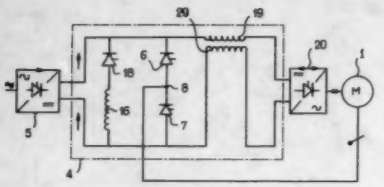
ADAPTER FOR INTERMEDIARY CIRCUIT OF A STATIC CONVERTER ASSEMBLY

Albert C. Wiart, Sannois, France, assignor to Jeumont Schneider Corporation, Puteaux, France

Filed Apr. 21, 1981, Ser. No. 256,115
Claims priority, application France, Apr. 24, 1980, 80 09187
Int. Cl.³ H02P 5/40; H02M 5/45
U.S. Cl. 318—803 **2 Claims**

1. A direct current intermediary circuit of an assembly for transforming input power to output alternating current power by the commutation of input and output static converter means to drive electric motor means connected to the output converter means, the circuit comprising a first branch including in series a free-wheeling switch and a first inductance connected to output terminals of the input converter means, said free-wheeling switch being arranged to be operated upon commu-

tation of the input converter means when the output converter means is not being commutated so as to connect the first inductance to the output terminals of the input converter means; a second branch including in series two thyristors connected to the output terminals of the input converter means; and second and third inductances with a high mutual inductance coupling coefficient, the second and third inductances each being connected to a different output terminal of the input converter means and to a different input terminal of the output converter means, the first inductance having a value selected to be equal to the sum of the loss inductance of the electric motor means and the mutual inductance of said second and third inductances so as to afford substantially the same inductance value on the output terminals of the input converter means upon operation of the free-wheeling switch.

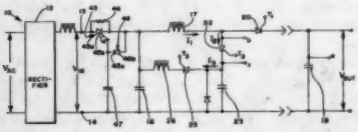


4,405,889

POWER SUPPLY FOR REPETITIVE DISCHARGE APPARATUS

Scott M. Overstreet, Los Altos Hills, and C. Henning Swenson, Los Altos, both of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,157
Int. Cl.³ H02J *15/00*
U.S. Cl. 320—1 **2 Claims**



1. A power supply for repetitively charging utilizing apparatus from an unregulated DC voltage source having a pair of terminals comprising

first and second capacitors connected across said terminals, said first capacitor being adapted to be charged by said source, said second capacitor constituting part of said utility apparatus,

a first inductor connected in series between said capacitors,

a first bistable switch connected between said inductor and said second capacitor,

a first means to trigger said switch to the conducting state for electrically connecting said capacitors through said inductor whereby said first capacitor discharges current through said inductor to resonantly charge said second capacitor,

a third capacitor connected across said terminals in between said inductor and said switch,

a second bistable switch connected in series with said third capacitor,

second means responsive to a predetermined voltage on said second capacitor for triggering said second switch to the conducting state and electrically connecting said inductor to said third capacitor whereby charging current from said first capacitor to said second capacitor is diverted to said third capacitor to resonantly charge the latter,

a second inductor and a third bistable switch connected in series between said first and third capacitors, and

third means for triggering said third switch to the conducting state and electrically connecting said third and first capacitors through said second inductor whereby energy in said third capacitor is transferred to said first capacitor,

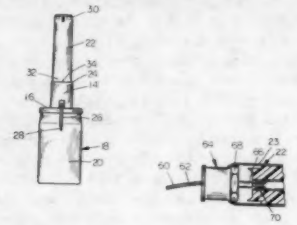
said first and third means both being responsive to said predetermined voltage on said second capacitor for triggering said first and third switches simultaneously.

4,405,890

RECHARGEABLE GLOW PLUG ENERGIZER

Wilford L. Hicks, Jr., 3421 Biggs, Omaha, Nebr. 68123

Filed Aug. 3, 1981, Ser. No. 289,506
Int. Cl.³ H02J *7/02*
U.S. Cl. 320—2 **8 Claims**



1. A hand held rechargeable energizer for energizing the glow plug of a glow fuel combustion engine comprising,

a rechargeable battery having oppositely charged terminal portions,

an extension means having one end connected to one terminal portion of said battery and an opposite end extended outwardly therefrom,

a Headlock connector having a free end having a pair of terminals adapted for releasable electrical connection to a glow plug and a rechargeable plug of a recharger unit and an opposite base end connected to said opposite end of the extension means so that said free end extends outwardly from said battery by a distance greater than the length of said Headlock connector,

one terminal of said Headlock connector being electrically connected to said one terminal of the battery, and

means for electrically connecting the other terminal of the Headlock connector to the opposite terminal portion of the battery.

4,405,891

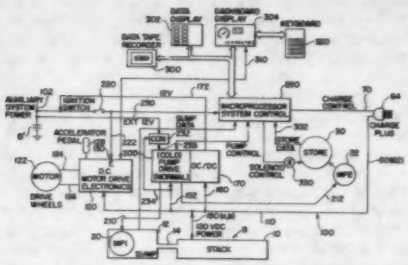
CONTROL SYSTEM FOR ELECTRIC POWERED VEHICLE

James H. Galloway, New Baltimore, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jul. 13, 1981, Ser. No. 282,497
Int. Cl.³ H01M *10/44*
U.S. Cl. 320—15 **16 Claims**

1. In a control system for an electric powered motor vehicle of the type including a D.C. motor drivingly connected to roadway engaging drive wheels of said vehicle, said control system including control means for operating said D.C. drive motor with a voltage having a pre-selected magnitude; a first storage battery supported on said vehicle and having a charging mode and discharging mode with a voltage rating during both of said modes generally equal to said pre-selected magnitude; a circulating pump associated with said first storage battery for activating said first storage battery; and, means for driving said pump by said first storage battery during said discharging mode of said first storage battery, the improvement in said system comprising: a second storage battery; manually actuated start means producing an enabling signal to

allow said D.C. motor to be driven by said first storage battery, means for driving said circulation pump for the first storage



battery with said second storage battery for a limited time after manual actuation of said start means.

4,405,892

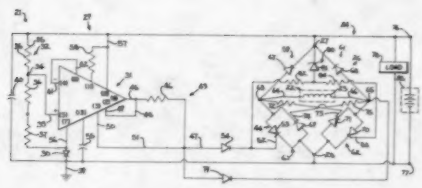
REGULATOR FOR A GENERATOR ENERGIZED BATTERY

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 59,054, Jul. 19, 1979, Pat. No. 4,320,335. This application Dec. 31, 1980, Ser. No. 221,624

Int. Cl.³ H02J *7/10*; H02P *9/00*

U.S. Cl. 322—89 **2 Claims**



1. An energy regulating system to maintain a charge on a battery by an electrical energy generating winding of a generator, said regulating system comprising

a full wave rectifying bridge circuit having first and second legs including first and second diodes, respectively, having cathode circuits mutually electrically connected to a first terminal of said battery and third and fourth legs including first and second controlled rectifiers, respectively, having anode circuits mutually electrically connected to a second terminal of said battery,

said winding having a first end electrically connected to a first connection joining said first and third bridge legs and a second end electrically connected to a second connection joining said second and fourth bridge legs,

a first firing control circuit connected to said first connection and to a gate circuit of said second controlled rectifier to gate said second rectifier into conduction in response to a predetermined energy phase supplied by said winding,

a second firing control circuit connected to said second connection and to a gate circuit of said first controlled rectifier to gate said first rectifier into conduction in response to a predetermined energy phase supplied by said winding;

a first switch connecting said first connection to a system ground and a second switch connecting said second connection to said system ground,

a charge sensor electrically connected to said battery and operating from a first condition to a second condition to provide a charge signal in response to said battery charge being above a predetermined magnitude,

a phase sensor electrically connected to said winding to provide a phase signal in response to the energy generated by said winding,

a control circuit electrically connected to said charge and phase sensors to operate said first switch from a first condition to a second condition to interrupt the energy flow to the battery in response to said charge and phase signals, and

a second sensor electrically connected to said rectifying circuit to sense the energy thereat and to operate said first and second switches from a first condition to a second condition in response to the sensed energy exceeding a second predetermined magnitude greater than said first magnitude to de-activate said rectifying circuit.

4,405,893

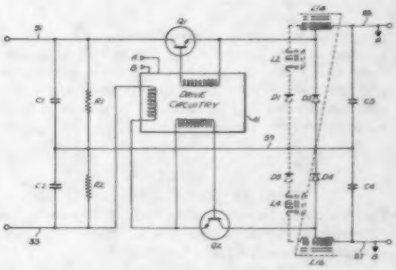
PULSE WIDTH REGULATOR

John E. Rance, Redondo Beach, Calif., assignor to Gulton Industries, Inc., Hawthorne, Calif.

Filed Jul. 6, 1981, Ser. No. 280,205

Int. Cl.³ H02P *13/32*

U.S. Cl. 323—271 **4 Claims**



1. A pulse width regulator comprising:

(a) means for dividing an unregulated input DC voltage into a plurality of unregulated input DC voltages;

(b) switch means including a plurality of semi-conductor switches coupled to said voltage dividing means, wherein each semi-conductor switch is adapted to switch one of said plurality of input voltages on and off to produce a plurality of pulses;

(c) integrating means for integrating said plurality of pulses, said integrating means coupled to said switch means, whereby said pulses are converted into a regulated DC output voltage;

(d) storage means for improving switching losses of said semi-conductor switches, said storage means comprising a plurality of saturable reactor-inductor pairs electrically connected to each other through diodes and coupled to said integrating means.

4,405,894

VOLTAGE CONTROL AND BALANCING CIRCUIT

Richard M. Rice, Afton, and Stanley M. Hartman, Harrisonburg, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

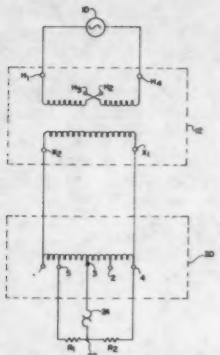
Filed Oct. 21, 1981, Ser. No. 313,265

Int. Cl.³ H02J *3/00*

U.S. Cl. 323—340 **5 Claims**

1. A circuit for controlling an alternating current voltage supply to a pair of resistances comprising a main transformer, said main transformer having a plurality of taps, a pair of which may be connected as an input from said alternating current voltage supply and another pair of which may be selected to thereby provide a plurality of fixed step down or step up transformation ratio outputs, and a variable auto trans-

former having a plurality of taps, a pair of which are connected as an input thereof to said output of said main transformer and another pair of which may be selected to thereby provide a plurality of fixed step down or step up transformation ratio outputs, said resistances being connected in series to said output of said variable auto transformer and having a null point between said resistances connected to a variable output tap of said variable auto transformer, whereby a selected transformation ratio provided by said main transformer and said variable auto transformer may be balanced by said variable output tap between said resistances.

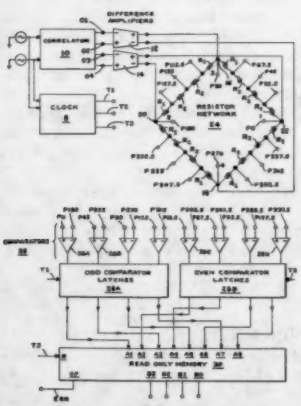


4,405,895

ANGLE DIGITIZING METHOD

Carl W. Gerst, Skaneateles; Leonard J. Paciorek, North Syracuse, and Thomas L. Sly, Cicero, all of N.Y., assignors to Anaren Microwave, Inc., Syracuse, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,489
Int. Cl.³ G01R *25/00*
U.S. Cl. 324—83 D **11 Claims**



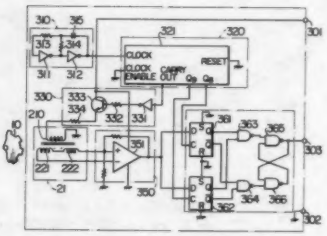
1. In apparatus for converting a signal representing sin θ and a signal representing cos θ to a digital value representing the angle θ which includes first and second input terminals across which is applied a signal proportional to sin θ, third and fourth input terminals across which is applied a signal proportional to cos θ, four sets of the same number of impedors, a first of the sets being connected between the first and third input terminals, a second of the sets being connected between the third and second input terminals, a third of the sets being connected between the second and fourth input terminals, a fourth of the sets being connected between the fourth and first input terminals, a plurality of output terminals, each of the output terminals being connected to the junction of each pair of adjacent impedors, and a plurality of two-input logic means for giving a first level signal at an output when the signal at one input is greater than the signal at the other input and for giving a second level signal at said output when the signal at said one input is less than the signal at said other input, the two inputs of each logic means being connected to a pair of said output terminals which have an antiphase relationship whereby each logic means generates a bit value associated with a different position of a digital word, the method of increasing the reliability of the apparatus comprising the steps of sampling a first subset of the logic means to obtain the bits of a first partial digital word, a given time thereafter sampling a second subset of the logic means to obtain the bits of a second partial digital word, combining the first and second partial digital words to form a complete digital word, and determining if said full digital word is in a set of digital words representing angles.

4,405,896

TRANSFORMER COUPLED POSITION DETECTING APPARATUS WITH PHASE CHANGE DETECTOR

Sigeyuki Akita, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 86,034, Oct. 18, 1979, abandoned. This application Nov. 9, 1981, Ser. No. 319,679
Claims priority, application Japan, Nov. 23, 1978, 53-145031
Int. Cl.³ G01B *7/00*; G01P *3/48*; G01R *25/00*
U.S. Cl. 324—208 **3 Claims**



1. A position detecting apparatus comprising:

a transformer having a primary coil and a pair of secondary coils arranged on both sides of said primary coil, said primary coil and said secondary coils being respectively wound on a coil bobbin having a bore in which a single rod-shaped iron core is placed, said secondary coils being connected to each other in opposition to the polarity of each other, and one of said secondary coils being smaller in number of turns than the other of said secondary coils;

an energizing source including an oscillator circuit oscillated at a predetermined frequency for energizing said primary coil;

a rotating body made of a magnetic material and having a plurality of alternate projections and depressions of predetermined shapes along a surface thereof disposed to oppose one end of said transformer whereby rotation of said rotating body varies a magnetic coupling between said primary coil and said secondary coils so as to change the phase of a composite voltage signal produced by said secondary coils;

a comparator circuit having two comparison inputs respectively connected directly to one and the other ends of said secondary coils connected in opposite polarity to each other so as to generate a digital signal of high and low levels in response to said composite voltage signal applied from said secondary coils to said comparison inputs; and

a signal generating circuit for generating a first and a second

detection signal having a phase different from each other in synchronism with oscillation signals from said oscillator circuit;

a phase change detecting circuit for detecting the phase of said rectangular wave output generated from said comparator circuit whereby a rotational position signal is generated in response to a change in the phase of said rectangular wave output of said comparator circuit caused in response to the rotation of said rotating body,

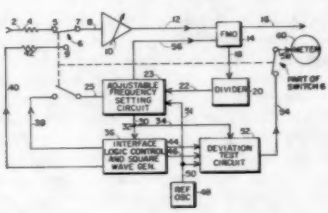
said phase change detecting circuit comprising a first and a second memory circuit each including a D-type flip-flop respectively responsive to said first and second detection signals to store said rectangular wave output of said comparator circuit, a first NAND circuit for producing a logical product of non-inverted output signals of said first and second memory circuits and a second AND circuit for producing a logical product of inverted output signals of said first and second memory circuits, and a final-stage memory circuit driven by said logical product signals.

4,405,897

FREQUENCY DEVIATION TESTING AND ADJUSTING SYSTEM FOR FREQUENCY MODULATED OSCILLATORS

Alistair W. Taylor, North Vancouver; Josef Fikart, Port Coquitlam, and David Thompson, Coquitlam, all of Canada, assignors to AEL Microtel Ltd., Burnaby, Canada

Filed Mar. 2, 1981, Ser. No. 239,757
Int. Cl.³ G01R *23/15*
U.S. Cl. 324–78Z **5 Claims**



1. Apparatus for setting the frequency deviation of a frequency modulated oscillator (FMO) that operates at a prescribed carrier frequency and has a frequency control input and a modulation signal input, comprising:

a square wave modulation signal generating circuit generating a square wave that is selectively applied to the FMO's modulation signal input, and that is of amplitude that is adjusted to modulate the FMO so as to produce a predetermined amount of symmetrical periodic frequency shift or deviation above and below the carrier frequency for a desired setting of the modulation sensitivity of the FMO;

an adjustable frequency setting circuit providing at a first output terminal that is coupled to the control input of the FMO a signal controlling the carrier frequency, accepting at a first input terminal the output signal of the FMO so as to provide at a second output terminal a binary signal having a predetermined pulse repetition rate when the carrier frequency is present, and accepting at a second input terminal the square wave modulation signal so as to vary the frequency adjustment in order to obtain the predetermined pulse repetition rate at said second output terminal when the FMO produces the predetermined deviation and a different pulse repetition rate otherwise;

a reference oscillator for providing a binary signal having a pulse repetition rate at said predetermined rate;

means for comparing the binary output signals from said adjustable frequency setting circuit and from said reference oscillator to determine if there is a difference therebetween; and

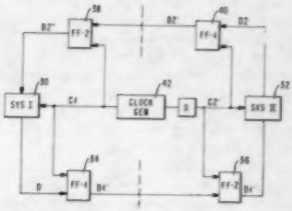
means for indicating when said difference is at a minimum; the modulation sensitivity of the FMO being adjusted to produce the predetermined amount of deviation in the output thereof.

4,405,898

PSEUDO SYNCHRONOUS CLOCKING

Donald C. Flemming, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,380
Int. Cl.³ H03L *7/06*; H03K *5/00*
U.S. Cl. 328—72 **9 Claims**



1. In a computer system in which data is transmitted across an interface between parts of the computer under the control of separate clocks operated at different frequencies, the method comprising:

operating the two clocks at two mutually non-harmonic frequencies whose periods T_1 and T_2 form a ratio

$$S = \frac{T_{2/\alpha}}{T_{1/\alpha}}$$

that is a rational number so that there is a limited number of different phase relationships between sets of critical transitions in the pulses of the two clocks where α is the largest common denominator of the periods T_1 and T_2 in the ratio S

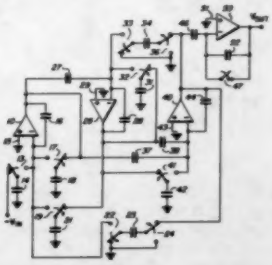
offsetting the occurrence of one set of critical sets of transitions of said two clock pulses by an amount less than $T_{n/\alpha}$ whereby metastability is prevented from occurring as a result of use of mutually non-harmonic frequencies in the two clocks.

4,405,899

HIGH PASS FILTER AND METHOD OF MAKING SAME

Henry Wurzburg, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 1, 1979, Ser. No. 16,695
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—107 **12 Claims**



1. A high pass, switched capacitor filter having an input and

an output, comprising: a first operational amplifier having a first and a second input and an output, the second input being coupled to a reference terminal; a first capacitor coupled to the reference terminal; a first switch for switching the first capacitor to the filter input and then to the first input of the first amplifier; a second capacitor coupled between the first input and the output of the first amplifier; a third capacitor coupled to the reference terminal; a second switch for switching the third capacitor to the output of the first amplifier or to the first input; a second operational amplifier having a first and a second input and an output, the second input being coupled to the reference terminal; a fourth capacitor coupled between the output of the first amplifier and the first input of the second amplifier; a fifth capacitor coupled between the first input of the second amplifier and the output of the second amplifier; a sixth capacitor coupled to the reference terminal; a third switch for coupling the sixth capacitor to the output of the second amplifier or to the first input of the second amplifier; a seventh capacitor coupled to the reference terminal; a fourth switch for switching the seventh capacitor to the output of the second amplifier or to the first input of the first amplifier; a third operational amplifier having a first and a second input and an output, the second input being coupled to the reference terminal; an eighth capacitor coupled between the output of the second amplifier and the first input of the third amplifier; a ninth capacitor coupled between the output of the first amplifier and the first input of the third amplifier; a tenth capacitor coupled to the reference terminal; a fifth switch for switching the tenth capacitor to the output of the second amplifier or to the first input of the third amplifier; an eleventh capacitor coupled between the output of the third amplifier and the first input of the third amplifier; a twelfth capacitor having a first and a second terminal; a sixth switch for switching the first terminal of the twelfth capacitor to the output of the third amplifier or to the reference terminal; a seventh switch for switching the second terminal of the twelfth capacitor to the first input of the first amplifier or to the reference terminal; a thirteenth capacitor having a first and a second terminal; an eighth switch for switching the first terminal of the thirteenth capacitor to the output of the third amplifier or to the reference terminal; and a ninth switch for switching the second terminal of the thirteenth capacitor to the reference terminal or to the first input of the second amplifier.

4,405,900

OPERATIONAL AMPLIFIER

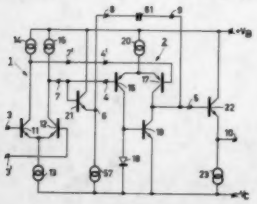
Rudy J. van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1981, Ser. No. 252,483

Claims priority, application Netherlands, May 9, 1980, 8002666

Int. Cl.³ H03F 3/45

U.S. Cl. 330—151 **9 Claims**



1. An operational amplifier comprising at least a first amplifier stage, a second amplifier stage, which is driven by the first amplifier stage, and a first and a second junction point between which a capacitive signal path, for improving the high-frequency properties of the operational amplifier, is included characterized in that the first junction point is coupled to an output of the first amplifier stage and that the second junction point is coupled to an output of the second amplifier stage, the capacitive signal path, relative to the signal path via the second amplifier stage, constituting a positive feed-forward and the impedance at the second junction point, viewed from said capacitive signal path, being comparatively high-relative to the impedance at the first junction point, viewed from said capacitive signal path.

4,405,901

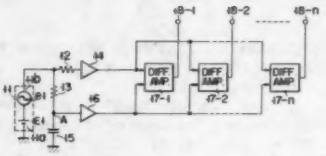
SIGNAL PROCESSING CIRCUIT

Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 23, 1981, Ser. No. 237,111

Int. Cl.³ H03F 3/45

U.S. Cl. 330—261 **6 Claims**



1. A signal processing circuit comprising:

at least one differential amplifier having first and second input terminals;

means for providing a first signal including a DC component to said first input terminal;

a low-pass filter connected to said first signal providing means for extracting said DC component from said first signal, said filter including a first resistor and a capacitor connected in series between said first input terminal and a reference potential source;

means for providing a DC bias to said second input terminal, said bias means including a compensation resistor for compensating for the voltage drop across said first resistor;

a select switch connected between said compensation resistor and said first input terminal and having a first fixed terminal connected to one end of said compensation resistor, a movable terminal and a second fixed terminal for receiving a second signal; and

a second resistor of a high resistance value connected between said second fixed terminal and said second input terminal.

4,405,902

PUSH-PULL OUTPUT STAGE

Rudy J. van de Plassche, and Eise C. Dijkmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,364

Claims priority, application Netherlands, May 27, 1980, 8003053

Int. Cl.³ H03F 3/30

U.S. Cl. 330—271 **7 Claims**

1. A push-pull output stage having an input terminal, an output terminal, a first supply terminal, and a second supply terminal, which output stage comprises:

a first transistor of a first conductivity type, connected in common-collector arrangement, the collector thereof being coupled to the first supply terminal, the emitter thereof being coupled to the output terminal and the base thereof being coupled to the input terminal;

a second transistor of the first conductivity type, connected

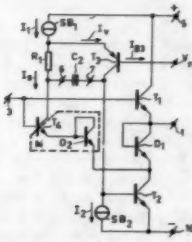
in common-emitter arrangement, the emitter thereof being coupled to the second supply terminal;

a first semiconductor junction having a first and a second electrode, which semiconductor junction is included in the collector main current path of the second transistor, the first electrode thereof being coupled to the output terminal and the emitter of the first transistor, in such a way that, viewed from the output terminal, the forward direction of the first semiconductor junction is opposed to the forward direction of the base-emitter junction of the first transistor, and the second electrode thereof being coupled to the collector of the second transistor;

a third transistor of a second conductivity type opposite to the first conductivity type, connected in common-base arrangement, the base thereof being coupled to a reference potential; and

a first signal path, which includes the emitter-collector path of the third transistor, the collector of the third transistor being coupled to the base of the second transistor;

characterized in that the push-pull output stage further comprises:



a measuring circuit comprising the base-emitter junction of a fourth transistor of the first conductivity type, said measuring circuit being coupled between the base of the first transistor and the second electrode of the first semiconductor junction, the collector of the fourth transistor being coupled to said first signal path for applying a drive current, generated thereby from the voltage between the base of the first transistor and the second electrode of the first semiconductor junction, to the base of the second transistor in phase opposition to the input signal;

a first impedance in the first signal path, having one terminal coupled to the emitter of the third transistor and the other terminal coupled to the collector of the fourth transistor; and

first means for bypassing a part of the first signal path, coupled between the other terminal of the first impedance and the collector of the third transistor, said first means for bypassing comprising a second impedance which, at least, transfers signals of comparatively high frequencies, whereby, in the case of poor high-frequency properties of the third transistor, the push-pull output stage still performs satisfactorily at high frequencies.

4,405,903

VARIOLOSSER FOR AN AUTOMATIC GAIN CONTROL CIRCUIT

Tom L. Blackburn, San Jose, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Mar. 27, 1981, Ser. No. 248,659

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—284 **4 Claims**

1. In an automatic gain control circuit, a variolosser interposed between a signal and a fixed gain amplifier for maintaining a substantially constant output level from the latter, comprising:

first means for electrically connecting at least a pair of DC impedance elements in series with an input terminal of the amplifier;

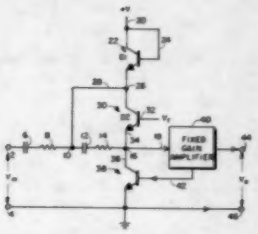
second means for developing a control voltage that is proportional to the output voltage of the amplifier;

a first transistor responsive to said control voltage for developing a control current that is proportional to said output voltage;

a supply voltage source;

a reference voltage source; and

a network including at least a second transistor and a diode means, which is a variable impedance element, having their primary conduction paths electrically connected in series with the primary conduction path of said first tran-



sistor across said supply voltage source for passing the control current, and third means for electrically connecting a first junction, that is between said diode means and said second transistor, to a second junction, which is between said pair of DC impedance elements; said second transistors base and emitter being electrically connected to said reference voltage source and to one of said first transistors emitter and collector, respectively; said second transistor providing bias voltage for said fixed gain amplifier, with the base-emitter portion thereof also operating as a variable impedance element in said network, whereby the output of the amplifier is maintained constant over a wide range of input signals to said network.

4,405,904

POWER CONTROL CIRCUIT FOR A MAGNETRON OSCILLATOR

Yoshio Oida, Funabashi; Masayuki Sasaki, Sagamihara, and Hidetoshi Semi, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 217,845, Dec. 18, 1980, abandoned, which is a continuation of Ser. No. 70,125, Aug. 27, 1979, abandoned, which is a continuation of Ser. No. 928,868, Jul. 28, 1978, abandoned. This application May 25, 1982, Ser. No. 381,760

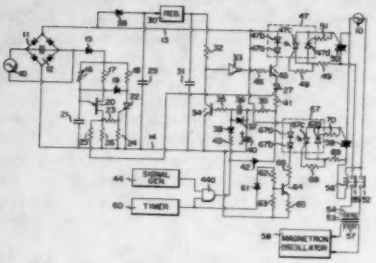
Claims priority, application Japan, Jul. 30, 1977, 52-91616

Int. Cl.³ H05B *6/68*

U.S. Cl. 331—87 **6 Claims**

1. A microwave generator comprising means for generating a zero-crossing trigger signal in response to input current supplied from an alternating current power source, an SCR turned on by said zero-crossing trigger signal, a first switch element connected in series with said SCR across a direct current power supply, means for generating a power control signal having a pulse width corresponding to an amount of power to be supplied, a first switch element operating circuit for on-off operating said first switch element according to said power control signal, a magnetron oscillator, a second switch

element inserted between the magnetron oscillator and alternating current power source, a second switch element operating circuit for turning on said second switch element when said SCR and first switch element are turned on.



4,405,905

ATOMIC FREQUENCY STANDARD HAVING MICROWAVE LOOP AROUND ABSORPTION CELL

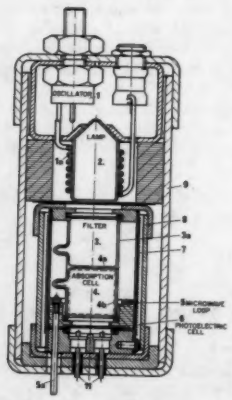
Giovanni Busca, Neuchatel, and Leland Johnson, La Chaux-de-Fonds, both of Switzerland, assignors to Oscilloquartz S.A., Switzerland

Filed Jan. 12, 1981, Ser. No. 224,133

Claims priority, application Switzerland, Jan. 11, 1980, 204/80

Int. Cl.³ H03L 7/26

U.S. Cl. 331—94.1 10 Claims



1. An atomic frequency standard comprising an optical pumping device comprising a source of light of a given spectral composition, a cell containing an alkali metal in gas form which is disposed to receive said light, means for detecting the light transmitted by the cell and producing a detection signal representing the transmission of the light; and means for applying a substantially constant magnetic field to the cell; an arrangement for subjecting the cell to an electromagnetic wave inducing a hyperfine spectral transition of the atoms of the metal, which increases the absorption of the light by the cell; and control means responsive to the variations in the detection signal for modifying the frequency of the said wave so as to center it substantially on the frequency of the hyperfine spectral transition, the improvement wherein

(1) said cell lacks a buffer gas and is internally covered with a non-disorienting layer; and

(2) said arrangement produces a progressive electromagnetic wave widening the line of absorption of the cell by the Doppler effect in order to permit a reduction in the control time constant.

4,405,906

LOW POWER CONSUMPTION C-MOS OSCILLATOR

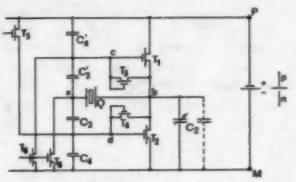
Jakob Luscher, Venthone, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Jul. 10, 1981, Ser. No. 282,030

Claims priority, application Switzerland, Jul. 21, 1980, 5555/80

Int. Cl.³ H03B 5/36

U.S. Cl. 331—116 FE 10 Claims



1. In a C-MOS oscillator circuit of the type having input and output terminals, between which a resonator can be connected, first and second supply terminals adapted to be connected to the positive and negative poles, respectively, of a source of d.c. supply voltage, a first P-type MOS transistor and a second N-type MOS transistor, the sources of said transistors being connected to the first and second supply terminals, respectively, and the drains of said transistors being connected to one another and to said output terminal, an output capacitor connected between said output terminal and one of said supply terminals, and means for independently biasing said first and second transistors, the improvement wherein said biasing means comprises:

a third P-type MOS transistor, the gate and drain thereof being connected to the gate of said first transistor and the source thereof having connected to the drain of said first transistor;

a first current source connected between the gate of said first transistor and said second supply terminal;

a first capacitive divider connected between said input terminal and said first supply terminal, the intermediate point of said divider being connected to the gate of said first transistor;

a fourth N-type MOS transistor, the gate and drain thereof being connected to the gate of said second transistor and the source thereof being connected to the drain of said second transistor;

a second current source connected between the gate of said second transistor and said first supply terminal; and

a second capacitive voltage divider connected between said input terminal and said second supply terminal, the intermediate point of said divider being connected to the gate of said second transistor.

4,405,907

CONTROLLABLE PHASE SHIFTER COMPRISING GYROMAGNETIC AND NON-GYROMAGNETIC SECTIONS

Maurice E. Breese, Moorestown, N.J., and Arthur S. Robinson, Reston, Va., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,848

Int. Cl.³ H01P 1/195

U.S. Cl. 333—24.1 8 Claims

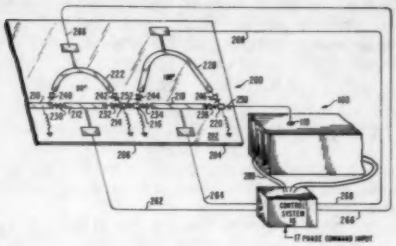
1. A phase shifter for controllably shifting the phase of RF signals by selected amounts comprising:

first and second transmission line sections connected in series;

said first section including gyromagnetic material and means

for controlling the magnetic field in said gyromagnetic material to provide a controllable phase shift; and

said second section being non-gyromagnetic and including controllable switching means for reversing the sense of the RF current and hence the phase of RF signals propagating along said second section;



said phase shifter designed for said first and second sections to each make a variable contribution to the overall phase shift, that contribution being dependent on the selected overall phase shift.

4,405,908

FILTER CIRCUIT HAVING A CHARGE TRANSFER DEVICE

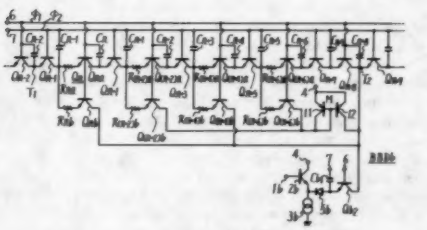
Mitsuo Soneda, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,161

Claims priority, application Japan, Apr. 11, 1980, 55/48478; Apr. 15, 1980, 55/49660; Sep. 16, 1980, 55/128179; Sep. 26, 1980, 55/134610

Int. Cl.³ H03H *15/02;* **G11C** *27/00, 27/02*

U.S. Cl. 333—165 **43 Claims**



1. A filter circuit comprising charge transfer means, including first and second sets of charge storage means, said first set of charge storage means being supplied with a first clock signal and said second set of charge storage means being supplied with a second clock signal, first and second sets of switch means, said first set of switch means being actuated in response to said first clock signal and said second set of switch means being actuated in response to said second clock signal, respective ones of said switch means in said first set being operable when actuated to transfer charge between a charge storage means in said first set and a charge storage means in said second set and respective ones of said switch means in said second set being operable when actuated to transfer charge between a charge storage means in said second set and a charge storage means in said first set, and means for supplying said first and second clock signals to said first and second sets of charge storage means, respectively, and to said first and second sets of switch means, respectively, thereby transferring a charge through succeeding switch means to be temporarily stored in succeeding charge storage means; means for supplying an input signal to a predetermined one of said charge storage means; semiconductor means actuated in response to a selected one of said first or second clock signals for transferring the charge stored in a predetermined first charge storage means to a predetermined second charge storage means, said predetermined first charge storage means and said predetermined second charge storage means being selected from any of said first and second sets of charge storage means; and output means coupled to a preselected charge storage means, which is selected from said first and second sets of charge storage means, for deriving an output signal from said filter circuit.

4,405,909

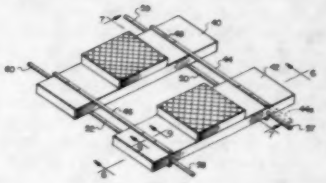
MECHANICAL FILTER WITH BOX-TYPE COUPLING STRUCTURE

Robert A. Johnson, Tustin, and Donald P. Havens, Costa Mesa, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 335,122

Int. Cl.³ H03H *9/50, 9/205*

U.S. Cl. 333—198 **6 Claims**



1. A mechanical bandpass filter comprising:

a pair of flexure-mode resonators each having first and second opposing planar sides, positioned in juxtaposed but spaced parallel planar relation by a parallelpiped-type coupling structure comprising wire-like coupling means having longitudinal axis on both planar sides of said resonators wherein flexure of said resonators causes primarily twisting of said coupling around said longitudinal axis thereof.

4,405,910

CONVERGENCE APPARATUS FOR COLOR CATHODE-RAY TUBE

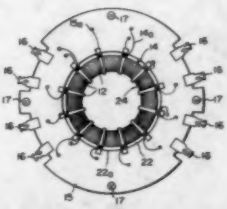
Shinji Ohtsu, Tokyo, Japan, assignor to Denki Onkyo Company Limited, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,186

Claims priority, application Japan, Sep. 25, 1981, 56-142382[U]; Sep. 25, 1981, 56-142383[U]; Sep. 25, 1981, 56-142384[U]; Sep. 29, 1981, 56-144314[U]; Sep. 30, 1981, 56-145952[U]; Jan. 11, 1982, 57-1872[U]; Jan. 18, 1982, 57-4775[U]; May 31, 1982, 57-81319[U]; Jun. 11, 1982, 57-100162

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—210 **10 Claims**



1. A convergence apparatus for color cathode-ray tube, which is provided with electron guns which emit three electron beams in in-line arrangement toward a screen of said color

cathode-ray tube at its neck part where said electron beams are deflected and scanned on said screen by a deflection yoke mounted on said neck part, comprising:

(a) a first bobbin which is annular in shape and has a flat plate, said bobbin being provided with 12N (N is an integer) segments which are radially extended on said annular plate and located to divide the circumference of said annular plate into 12N parts to form 12N winding sectors, said segments being extended outside the radial direction to respectively provide thereon a terminal plate fixing part and being provided with a segment base on the inner end part of the radial direction of said segment as being extended in a direction at right angles to said annular plate,

(b) an annular core made of a magnetic material to be mounted on said bobbin,

(c) two groups of 6-pole coils which are toroidally wound around said annular core by use of said winding sectors divided by said segments, said two groups of 6-pole coils being formed to generate six magnetic poles independently at positions with equidistance of approximately 30° therebetween in a circumferential direction of said annular core when a convergence current is supplied,

(d) two groups of 4-pole coils which are toroidally wound around said annular core by use of said winding sectors divided by said segments, said two groups of 4-pole coils being formed to generate four magnetic poles independently at positions with equidistance approximately 45° therebetween in a circumferential direction of said annular core when a convergence current is supplied,

(e) a terminal plate which has a through hole into which said bobbin can be accommodated, said terminal plate being provided with a number of recessions in its internal circumference to fix said bobbin to the terminal plate by engaging the terminal plate fixing part of said bobbin with said recessions, and

(f) a holder which engages with said terminal plate to support said terminal plate on the neck of said cathode-ray tube, said holder supporting said 6-pole coils and 4-pole coils at the specified position of said neck of the cathode-ray tube in a specified arrangement.

4,405,911

ELECTROMAGNETIC RELAY

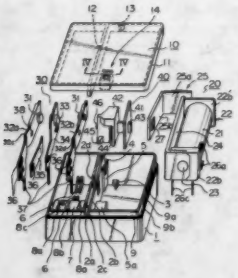
Hiroshi Hasegawa; Moriyasu Negita; Yoshiaki Kamiya; Masaru Tamura; Masaru Tamura, and Yuji Kinoshita, all of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 23, 1981, Ser. No. 304,904

Claims priority, application Japan, Sep. 26, 1980, 55-133733

Int. Cl.³ H01H *50/04*

U.S. Cl. 335—202 **13 Claims**



1. An electromagnetic relay comprising: a box-shaped relay case having an upper opening which is made of insulating material and which accommodates therein an electromagnet including at least a coil, a core and an armature, a group of resilient contacts, including holding resilient contacts and movable resilient contacts, and an operation card for transmitting a pivoting force of said armature to said movable resilient contacts in order to make or break electrical contact between said holding resilient contacts and said movable resilient contacts; and a relay cover which covers said upper opening of said relay case, wherein both said relay case and said relay cover have a partition wall for partitioning said electromagnet from said group of resilient contacts, said partition walls being formed integrally with said relay case and said relay cover on the inner sides of said relay case and said relay cover, and each partition wall overlapping the other when said relay cover is engaged with said relay case.

4,405,912

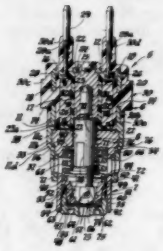
SOLENOID ASSEMBLY AND METHOD OF MAKING SAME

James D. Palma, Grand Rapids, and Michael J. Seino, Wyoming, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1982, Ser. No. 343,431

Int. Cl.³ H01F *7/08, 3/00*

U.S. Cl. 335—260 **2 Claims**



1. A solenoid assembly for use in an electromagnetic fuel injector for gasoline engines, said solenoid assembly including a sheet metal housing means having a tubular outer housing portion with radial openings therethrough and a perforated flange portion extending radially inward from one end of said housing portion, said flange portion having a central aperture therein; a cylindrical pole piece having one end received in said aperture and fixed to said flange portion with the other end of said pole piece located concentrically within said housing portion and extending toward the opposite open end of said housing portion; a solenoid coil means including a bobbin and a wire coil encircling said pole piece within said housing portion with portions of said solenoid coil means radially spaced from said housing portion; annularly grooved electrical lead means operatively connected at one end to said solenoid coil means with the opposite ends thereof extending outward of said housing means through said perforated flange portion; and, a plastic envelope means encircling said solenoid coil means to form a fluid tight seal between said solenoid coil means and the interior of said housing means and to fully envelop said flange portion and said one end of said pole piece and, to envelop at least an outer circumferential portion of said outer housing portion next adjacent to said flange portion and the grooved portion of each of said lead means.

4,405,913

COIL BODY

Ernest Finkbeiner, Grayslake, Ill., assignor to Mid-West Transformer Company, Grayslake, Ill.

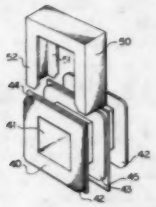
Filed Aug. 17, 1981, Ser. No. 293,199

Int. Cl.³ H01F *27/02, 27/30*

U.S. Cl. 336—98 **3 Claims**

1. A coil body comprising: a rectangular hollow core having an outer surface and having first and second spaced axial walls projecting outwardly from the core surface around all four

sides of the core substantially equidistantly from the outer surface, the projections being substantially to a first distance from the core outer surface, a first additional wall parallel to and closely spaced from the first wall projecting from the core outer surface to substantially the first distance around at least three sides of the core and substantially to at least the first distance on the fourth side of the core to create a first space between the first additional wall and the associated first wall, a second additional wall intermediate the first and second walls projecting from the core outer surface substantially equidistantly around the core to substantially the first distance to divide the area between the first and second walls and the primary and secondary winding areas, a third additional wall projecting from the outer surface parallel and closely spaced to the second additional wall to create a second space therebetween, the third additional wall projecting to substantially the first distance around three sides of the core and projecting to a second distance, greater than the first distance on the fourth side of the core, the projection on the fourth side being uninterrupted from the core's outer surface to the second distance, the second distance being greater than the first distance by an amount sufficient to establish a reverse path around the third additional wall on the fourth side at least equal to a minimum



creepage between the primary and secondary winding areas, established for a transformer to be constructed from said coil body, said second distance being less than the amount necessary to establish a minimum creepage path therearound a single channel cap member having a top and two legs projecting from the top at right angles thereto with axially spaced inturned wall portions of the top and leg portions, the inturned wall portion sides being spaced from one another equal to the axial distance between the first and second spaces and having a thickness dimensioned to be received in the first and second spaces, said cap assembled onto the coil body with the inturned end wall portions received in the spaces on the three sides of the core where the third additional wall projects to substantially the first distance and with the top and two legs of the cap covering the area around the core for at least one of the primary and secondary winding areas on said three sides, the fourth side of both primary and secondary winding areas being open and not covered by a cap whereby the creepage path length on the fourth side is established solely by the projection of the third additional wall to the second distance and the coil body axis length between the primary and secondary winding areas, the top of the cap lying on the side of the coil body opposite the third wall projection to the second distance.

4,405,914

FUSIBLE LINKS

Donald R. Ruegsegger, 425 W. Maple, Waterloo, Ind. 46793

Filed Sep. 18, 1981, Ser. No. 303,203

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—152 **6 Claims**

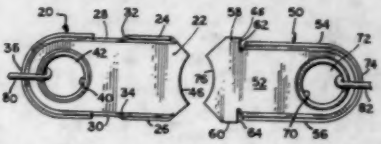
1. A break-away fuse comprising a pair of flat, thin metallic plates;

each plate including an upwardly extending elongated flange along opposite edges thereof;

said plates being in overlapping relation to one another, one end of one plate extending in one direction from the overlapped plates and one end of the other plate extending in the opposite direction; the lower section of the upper plate confronting the upper surface of the lower plate, said confronting surfaces adapted to be soldered together;

said flanges of said lower plate each having a notch formed therein;

said notches each having an edge inclined to the lower plate and forming a ramp edge, the inclinations of said ramp edges being substantially equal;



said upper plate having a tab extending transversely from each flange thereof, said tabs alignable with and insertable in a respective notch;

an edge corner of each tab being engageable with and slidable up the ramp edge of the respective notch when said ends are longitudinally pulled apart to lift said upper plate away from said lower plate.

4,405,915

PHOTOELECTRIC TRANSDUCING ELEMENT

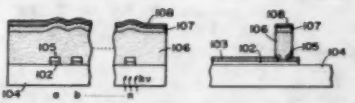
Toshiyuki Komatsu, Yokohama; Masaki Fukaya, Kawasaki; Shunichi Uzawa; Seishiro Yoshioka, both of Tokyo, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,218

Claims priority, application Japan, Mar. 28, 1980, 55-40064; Mar. 28, 1980, 55-40066; Mar. 28, 1980, 55-40067

Int. Cl.³ H01L *31/08, 27/14*

U.S. Cl. 338—15 **33 Claims**



26. A photoelectric transducer comprising:

(a) a light transmissive substrate;

(b) a light transmissive electrode provided on said substrate;

(c) a light transmissive contact layer to form an ohmic contact with said light transmissive electrode with respect to electric charge in at least one polarity;

(d) a photoconductive layer provided in contact with said light transmissive contact layer and comprising an amorphous material containing silicon as a matrix and at least one member selected from the group of hydrogen and halogen;

(e) second contact layer provided in contact with said photoconductive layer;

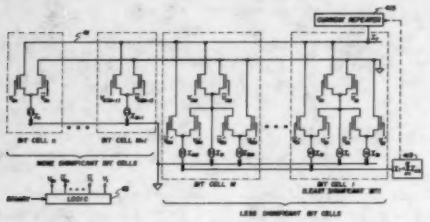
(f) a second electrode to form an ohmic contact with said second contact layer with respect to said charge;

(g) non-light transmissive layer provided in contact with said light transmissive electrode except where light is to be received.

4,405,916
DIGITAL-TO ANALOG CONVERTER HAVING SUPPLEMENTARY CURRENTS TO ENHANCE LOW CURRENT SWITCHING SPEED

Thomas Hornak, Portola Valley, and Gary L. Baldwin, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1982, Ser. No. 341,384
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **15 Claims**



1. A bit cell to controllably provide a weighted current I_k, said bit cell comprising:

a first switch having a switch input and a switch output, said first switch being responsive to an applied control signal V_{Gk} to conduct current applied at the switch input to the switch output when V_{Gk} assumes a first value V_1 and to divert that current away from the switch output when V_{Gk} assumes a second value V_2;

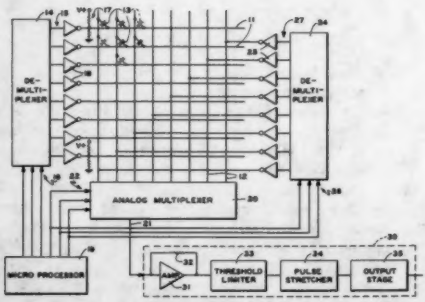
a source of current connected to the input of the first switch to supply a total current equal to the sum of the weighted current I_k and a supplementary current; and

means for subtracting from the output of the first switch a current sufficient to cancel any supplementary current conducted to the output of the first switch so that the net current supplied by the bit cell at the output of the first switch is I_k when V_{Gk} equals V_1 and is zero when V_{Gk} equals V_2.

4,405,917
MATRIX SCREENING AND GROUNDING ARRANGEMENT AND METHOD

Thomas Y. Chai, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 28, 1981, Ser. No. 258,248
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 C **9 Claims**



1. Capacitive keyboard apparatus comprising:

a matrix of capacitive key switches having first and second sets of conductors and a plurality of capacitors, each capacitor having fixed and movable plates, the fixed plates being connected to the first set of conductors and the movable plates being connected to the second set of conductors so that each capacitor is connected to a unique pair of conductors comprising one conductor from each of the first and second sets of conductors;

scanning drive means for sequentially supplying a drive signal to individual conductors of one of the first and second sets of conductors while maintaining all other conductors of the set at a reference potential;

a first digital demultiplexer having a plurality of output terminals which are normally at a logical high state and are selectively caused to go to a logical low state in response to an address signal supplied to address signal means thereon;

a plurality of inverters, each connecting an output terminal of said first digital demultiplexer to a separate conductor of the other of the first and second sets of conductors, whereby individual conductors of said other set are normally at the reference potential, and are selectively permitted to go to a different potential to permit sensing of capacitive coupling with conductors of said one of the first and second sets;

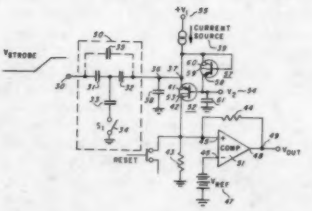
an analogue multiplexer having a plurality of input terminals each connected to a separate conductor in the set of conductors on which capacitive coupling is sensed, said analogue multiplexer being operable to transfer the signal from a selected conductor to an output terminal in response to an address signal supplied to address signal means; and

an address generator for supplying coordinated address signals to said first digital demultiplexer and said analogue multiplexer so that the conductor permitted to assume a potential different from the reference potential is the conductor whose signal is transferred by said analogue multiplexer, thereby precluding any transfer of signals between conductors other than the conductor receiving the drive signal and the conductor on which capacitive coupling is sensed.

4,405,918
CURRENT SENSING OF CAPACITIVE KEYBOARD ARRAYS

Frederick G. Wall, Garland, and Stephen C. Kwan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1980, Ser. No. 126,601
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 C **17 Claims**



1. In combination, a capacitive keyboard having keys each exhibiting a first value of capacitance when touched and a different value when untouched, electrical interrogating means connected to said keyboard and effective periodically to apply to the keys of said keyboard an interrogating electrical signal, means also interconnected with said keys and responsive to the application of said interrogating electrical signal for developing a first level of current flow when a key is touched and for developing a second different level of current flow when said key is untouched, both of said levels of current flow being greater than zero, said means for developing said first and said different level of current flow includes a capacitor and circuit

means including a transistor for establishing across said capacitor a first voltage when said key is touched and essentially the same voltage when said key is untouched and sensing means interconnected with said keyboard and responsive to said current flow for distinguishing between said first level and said second level.

4,405,919

METHOD OF FIRE DETECTION AND FIRE DETECTION INSTALLATION

Andreas Scheidweiler, Uerikon, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Filed Apr. 27, 1981, Ser. No. 257,783
Claims priority, application Switzerland, May 9, 1980, 3640/80
Int. Cl.³ G08B 17/10
U.S. Cl. 340—522 18 Claims

1. In a method for fire detection, wherein an electrical signal is generated as a function of combustion phenomena by a fire alarm installation containing at least two sensors responsive to different combustion phenomena and a common evaluation circuit for the evaluation of the condition changes of the sensors and for giving an alarm signal, the sensors operating according to respectively different principles and delivering respective electrical output signals as a function of the condition changes of the sensors resulting from detected combustion phenomenon, the improvement which comprises the steps of:

forming the quotient of the electrical signals delivered by the two sensors, in order to detect the transition from one type of combustion phenomenon to another type of combustion phenomenon; and

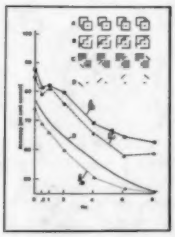
generating an alarm signal when the quotient exceeds a predetermined value or there arises a rapid change in the quotient.

4,405,920

ENHANCING THE PERCEPTIBILITY OF BARELY PERCEPTIBLE IMAGES

Naomi Weisstein, 407 Bleeker St., New York, N.Y. 10014

Filed Dec. 31, 1980, Ser. No. 221,849
Int. Cl.³ G09G 3/00
U.S. Cl. 340—700 11 Claims



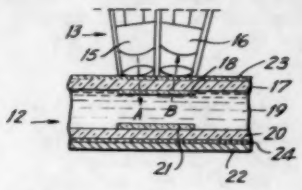
1. A method of enhancing the perceptibility to an observer of a target image in the presence of a noise image, the target image and the noise image forming a composite image, the noise image rendering the target image substantially unrecognizable when the composite image is viewed statically, the method comprising: (a) positioning the composite image to be viewable by an observer, and (b) repetitively exhibiting and obscuring at least a portion of the composite image at a frequency in the range of from about 0.2 to about 10 hz, the portion of the composite image repetitively exhibited and obscured including elements of the target image and elements of the noise image, whereby the perceptibility of the target image to the observer is enhanced.

4,405,921

LIQUID CRYSTAL DISPLAY DEVICE

Fumiaki Mukaiyama, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 11, 1981, Ser. No. 262,357
Claims priority, application Japan, May 12, 1980, 55-62536
Int. Cl.³ G09G 3/36
U.S. Cl. 340—708 14 Claims



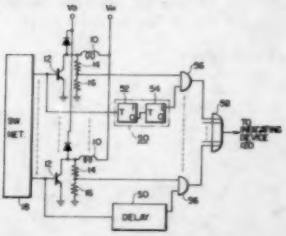
1. A liquid crystal display device comprising liquid crystal display means including a plurality of liquid crystal display dots arranged in a matrix array to define a group of rows and a group of columns, each said liquid crystal display dot having a row position and a column position, driving circuit means including flickering means for selectively flickering; each of said display dots between light-transmissive and non-transmissive states in a predetermined flickering timing, said flickering means providing a different switching time between said light-transmissive and non-transmissive states for each said row and column, respectively, in one of said groups of rows and columns of said display dots, said flickering means providing a different length of time that each respective row and column in the other one of said groups of rows and columns is in said light-transmissive state whereby each display dot has a unique flickering timing, light means for selectively directing light to selected display dots, said light being flickering by the switching of said selected display dots through which the light passes, and sensor means including light receiving means for detecting the flickered light passing through said selected display dots.

4,405,922

FAILURE DETECTION CIRCUIT FOR IMPACT PRINTERS OR THE LIKE

Shinichi Nishino; Shigenobu Katagiri, and Kazuyuki Kubo, all of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,573
Claims priority, application Japan, May 23, 1979, 54-64339
Int. Cl.³ H04Q 5/00; G08B 21/00
U.S. Cl. 340—825.36 10 Claims



1. A failure detection circuit for an apparatus having at least one electromagnet and a switching means connected therewith in series between the terminals of a voltage source for energizing said electromagnet, and a moving element movable from

an inactive to an active position in response to the energization of said electromagnet, comprising:

means for activating said switching means with a current insufficient to cause said electromagnet to be energized so that said moving element remains in said inactive position in response to a control signal at a first logic level and successively deactivating said switching means in response to a control signal at a second logic level; and

means for detecting when the signal level at a circuit junction between said electromagnet and switching means has a predetermined relationship with said logic levels to give warning indication.

4,405,923

GARAGE DOOR CONTROL SYSTEM

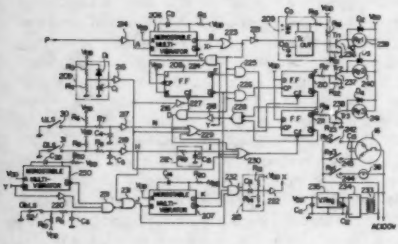
Shigeru Matsuoka; Takeshi Tokunaga; Seiji Yonekura; Kogi Yamauchi, and Mitsuo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,678

Claims priority, application Japan, Jan. 31, 1980, 55-11343

Int. Cl.[3] H04Q *9/00*; H02P *1/04*; E05F *11/60*

U.S. Cl. 340—825.56 16 Claims



1. A garage door control system comprising a door operating apparatus for operating a garage door, a plurality of push buttons for issuing a plurality of operating commands associated with the door operation by predetermined button operations, means for setting operating commands issued by said plurality of said push buttons, control means for controlling the operation of said door operating apparatus on the basis of an operating command set by said setting means, and a door stopping device for stopping the door operation by depressing a given one of said push buttons during door operation.

4,405,924

REMOTE CONTROL SWITCH APPARATUS FOR AUTOMOBILES

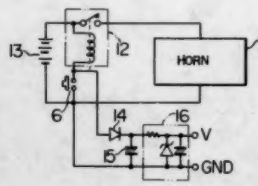
Yoshio Shinoda, Aichi, and Akira Kuno, Oobu, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 18, 1981, Ser. No. 245,208

Claims priority, application Japan, Mar. 21, 1980, 55-37789

Int. Cl.[3] G08C *19/00*

U.S. Cl. 340—825.72 3 Claims



1. A remote control switch apparatus for changing the driving condition of a car including a steering wheel said steering wheel including a horn switch for selectively completing a current path to actuate a horn, said steering wheel being rotatably mounted relative to both a nonmovable outer cover portion thereof and an instrument panel, said apparatus comprising:

at least one instruction switch for mounting on said steering wheel to project toward the inside of the passenger compartment of a car away from said instrument panel of the car so as to specify a driving condition;

an ultrasonic wave transmitter for mounting on said steering wheel and for generating an ultrasonic signal associated with said instruction switch; power supply means, comprising a diode and a capacitor connected across said horn switch, for providing power to said transmitter; and

an ultrasonic wave receiver for mounting on one of said instrument panel and said nonmovable outer cover portion of said steering wheel to oppose said transmitter and for generating a control signal corresponding to said ultrasonic signal when said transmitter and receiver are within a predetermined degree of alignment.

4,405,925

MICROWAVE TRANSCEIVER, PARTICULARLY FOR A DOPPLER RADAR SYSTEM

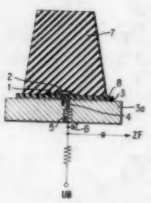
Kurt Lindner, Ulm, and Theodor Schütz, Memmingen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,693

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011238

Int. Cl.[3] G01S *13/56*

U.S. Cl. 343—5 PD 12 Claims



2. In a microwave transceiver for a Doppler radar system, which transceiver includes an antenna and a self-oscillating semiconductor mixer stage for both generating a microwave signal to be transmitted via the antenna and mixing that microwave signal with reflected microwave signal components received by the antenna, the mixer stage being composed of a nonlinear microwave diode connected to give the stage a negative impedance to permit oscillation and to effect mixing, and a half-wavelength disc-type resonator providing a resonant circuit for the oscillator and having the form of a stripline piece element composed of two strip conductors between which the microwave diode is electrically conductively connected, the antenna being a dielectric antenna disposed on one of the strip conductors, the diode having at least one lead which is brought through the resonator, and the transceiver further including a high frequency choke disposed on the side of the resonator facing away from the antenna and connected to the one diode lead, the improvement wherein said resonator and said antenna are constructed to be axially symmetrical and are positioned coaxially to one another and said microwave diode is positioned coaxially with respect to said resonator and said antenna.

4,405,926
METHODS AND APPARATUS FOR WARNING AIRCRAFT OF THE PRESENCE AND DIRECTION OF ELECTRICAL TRANSMISSION LINES

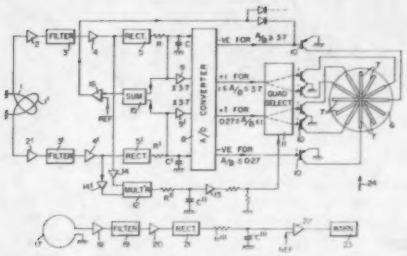
Keith E. Potter, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 816,515, Jul. 8, 1977. This application May 6, 1980, Ser. No. 147,295

Claims priority, application United Kingdom, Jul. 12, 1976, 28968/76

Int. Cl.³ G01S 5/04

U.S. Cl. 343—123 **22 Claims**



1. A method of warning a low-flying aircraft of the presence and direction, with respect to the aircraft, of a plurality of vertically separated electrical power transmission lines comprising:

intercepting the horizontal component of the resultant magnetic flux from said lines by two aircraft-mounted coils having their axes aligned generally horizontally and at an angle to one another;

deriving two signals proportional to the emf's induced in the respective coils by said flux;

and utilising the ratio of said two signals to indicate in the aircraft the direction of the transmission line with respect thereto.

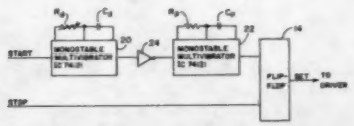
4,405,927
PHASE SHIFTER START/STOP ELECTRONIC TRIMMING

Jester M. Loomis, III, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 26, 1981, Ser. No. 266,771

Int. Cl.³ H01Q 3/38

U.S. Cl. 343—854 **4 Claims**



1. A phase shifter circuit for providing controllable time delay in phase shifter logic and comprising: a current driver for providing an output command signal to a load and adapted to receive an input control signal; a logic circuit having an output coupled as the input control signal for said driver, and having first and second inputs; and time delay means having an output coupled to said logic circuit first input, and having an input adapted for receiving an activating input signal; said time delay input and said logic circuit second input being adapted to receive respective start and stop input pulses for activating and deactivating said phase shifter circuit and thereby controlling the output command signal duration of said current driver; and said time delay means being a time delay and pulse forming network comprising first and second monostable multivibrators, each having an input and an output, the output of the first multivibrator being coupled to provide the input to the second multivibrator, the output of the second multivibrator being coupled as the first input to said logic circuit, and said first multivibrator input being the time delay means input.

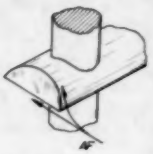
4,405,928
WIND LOAD REDUCTION IN TOWER MOUNTED BROADCAST ANTENNAS

Gerald F. Elsberad, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 17, 1980, Ser. No. 130,741

Int. Cl.³ H01Q 15/14

U.S. Cl. 343—912 **6 Claims**



1. In the stationary, tower mounted broadcast antenna structure having horizontally disposed elongated members through which the wind must blow, the improvement wherein said horizontally disposed elongated members have a cross section streamlined in the horizontal plane whereby wind load introduced by said horizontal members is reduced, said streamlined horizontal members having a curved surface and a flat surface, and being disposed so that said flat surface is horizontal.

4,405,929
THERMAL HEAD DEVICE

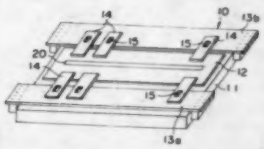
Osamu Sugano, Ikeda, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 26, 1981, Ser. No. 277,999

Claims priority, application Japan, Jun. 27, 1980, 55-87515; Jul. 3, 1980, 55-90999

Int. Cl.³ H05H 1/00; G01D 15/10

U.S. Cl. 346—76 PH **30 Claims**



1. A thermal head device for converting electrical signals, containing an image information, into heat signals to obtain a visual image on a medium such as a thermosensitive paper comprising:

a first substrate;

a plurality of resistive elements formed on said first substrate in the form of a single array having a lengthwise direction, said resistive elements being grouped into blocks, each block having a predetermined number of said resistive elements;

a plurality of first electrodes individually connected to a respective resistive element(s) in each of said blocks, all of said first electrodes in one block being provided on the

same side of said array with the positions of said first electrodes alternating from side to side relative to said array from block to block, said first electrodes in one block including at least horizontal sections which extend approximately in parallel with the lengthwise direction of said array to define at the end portions of said horizontal sections a group of contacts along an imaginary first contact line extending substantially perpendicularly to the lengthwise direction of said array so that said first contact line is defined on both sides of said array in an alternating manner with a pitch corresponding to the number of blocks defined along said array;

second electrode means provided in opposed relation against said first electrodes with respect to said array; and

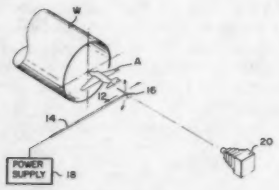
interconnection means mounted on said first substrate with one for each block, said interconnection means having a group of contacts along a second imaginary contact line matchingly contactable with the corresponding first contact line and a predetermined number of conductive paths for forming interconnections between an external circuit and said contacts along said second contact line.

4,405,930

SYSTEM FOR MAPPING A PHYSICAL VARIABLE

James P. Crowder, 3834 E. Mercer Way, Mercer Island, Wash. 98040

Filed Oct. 27, 1980, Ser. No. 201,019
Int. Cl.³ G01D *9/42, 9/00*
U.S. Cl. 346—107 R **13 Claims**



1. A system for mapping a physical variable, comprising:

a movable, elongated probe supported at a support location for scanning movement;

sensing means mounted on said probe at a location spaced apart from said support location for generating an output indicative of said physical variable;

light-emitting means mounted on said probe closely adjacent said sensing means so that said sensing means and light-emitting means move with each other despite any deflection of said probe, said light-emitting means receiving the output of said sensing means for generating illumination having a characteristic which varies in response to said output; and

photographic recording means receiving light from said light-emitting means for recording a characteristic of said light-emitting means as said movable probe causes said sensing means and said light-emitting means to scan over an area to be measured.

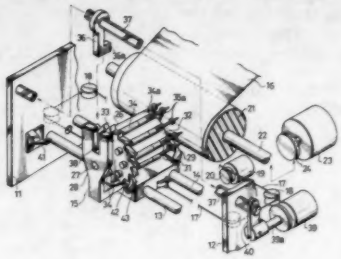
4,405,931

PEN TYPE MULTI-COLOR RECORDING DEVICE

Kyuichi Fujisawa, Tonan, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,143
Claims priority, application Japan, Feb. 16, 1981, 56-19221[U]
Int. Cl.³ G01D *15/16, 9/28*
U.S. Cl. 346—139 R **3 Claims**

1. A recording device for recording data in any of a plurality of colors, including a carriage having a rotary drum carrying a plurality of recording pens spaced around the periphery of said drum and capable of writing in respective colors, means for moving said carriage across the path of movement of a recording paper through a printing region opposite said recording paper and a pen-selecting region adjacent said printing region, pen-selection means for rotating said drum when said carriage is in said pen-selecting region to bring a selected pen into a printing position and for holding said drum against rotation when said carriage is in said printing region, and means carried by said carriage for urging the pen in said printing position



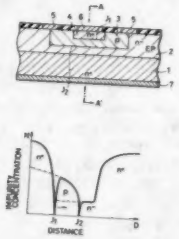
outward into contact with said printing paper, said pen-selection means including a cam mounted for rotation with said drum and having a plurality of teeth engaged by a stationary projection during movement of said carriage in said pen-selecting region whereby said drum can be rotated to bring a selected pen into the printing position by reciprocating said carriage within said pen-selecting region.

4,405,932

PUNCH THROUGH REFERENCE DIODE

Kiyoichi Ishii, Ohme; Hideharu Fujii, Yamanashi, and Kenji Kobayashi, Koufu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,974
Claims priority, application Japan, Dec. 26, 1979, 54-168395
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **19 Claims**



1. A punch-through reference diode comprising:

a semiconductor body;

a first semiconductor region of a first conductivity type which is formed within said semiconductor body;

a second semiconductor region of a second conductivity type which is formed within said semiconductor body, said second semiconductor region adjoining said first semiconductor region and defining a first PN-junction with said first semiconductor region; and

a third semiconductor region of said first conductivity type which is formed within said semiconductor body, said third semiconductor region adjoining said second semiconductor region and defining a second PN-junction with said second semiconductor region, whereby said second semiconductor region is located between said first PN-junction and said second PN-junction;

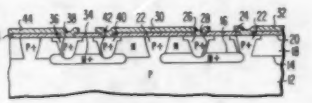
wherein said second semiconductor region has an impurity concentration distribution in which a concentration of an impurity of said second conductivity type increases from said first PN-junction towards said second PN-junction; said first and second semiconductor regions are provided with a connection for electrically connecting them in order to short said first PN-junction; said first and third semiconductor regions are respectively provided with connections for supplying a voltage so as to reverse-bias said second PN-junction; and a Zener breakdown voltage of said second PN-junction is greater than a punch-through voltage between said first and third semiconductor regions.

4,405,933

PROTECTIVE INTEGRATED CIRCUIT DEVICE UTILIZING BACK-TO-BACK ZENER DIODES

Leslie R. Avery, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,288
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **8 Claims**



1. A semiconductor device comprising: a substrate of one type conductivity having an interfacial surface,

a first region of the opposite type conductivity disposed adjacent a portion of said interfacial surface,

an epitaxial layer of said opposite type conductivity disposed over said interfacial surface and covering said first region, said epitaxial layer having a top surface opposite said interfacial surface,

a second region of said one type conductivity disposed adjacent said top surface and extending through said epitaxial layer to contact said first region and form a first PN junction therewith,

a third region of said one type conductivity disposed adjacent said top surface but spaced physically away from said second region and extending through said epitaxial layer to contact said first region and form a second PN junction therewith, and

first and second conductors in direct contact respectively with said third and said second regions at said top surface, whereby said first and said second PN junctions function as back-to-back zener diodes when a voltage potential exists between said first and said second conductors.

4,405,934

NPM ANTI-SATURATION CLAMP FOR NPN LOGIC GATE TRANSISTOR

Benjamin J. Sloan, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1981, Ser. No. 253,444
Int. Cl.³ H01L *29/48*
U.S. Cl. 357—15 **4 Claims**

1. In an integrated circuit device, the logic gate comprising:

a P-type semiconductor substrate;

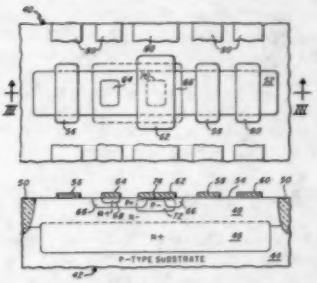
an epitaxial layer disposed on the substrate and having an upper surface upon which electrical contacts to the logic gate are made;

means extending from the upper surface to the substrate to define an isolated region of the epitaxial layer within which the logic gate is formed;

a low-resistivity N-type region disposed in the substrate immediately under the epitaxial layer and substantially laterally coextensive with the isolated region of the epitaxial layer;

the epitaxial layer having a high-resistivity N-type region adjacent to and overlying the low-resistivity N-type region and extending to the upper surface, a high-concentration P-type region formed within the high resistivity N-type regin and extending to the upper surface, a high concentration N-type region formed within the high-concentration P-type region and extending to the upper surface, a transport zone, and a high resistivity P-type region extending laterally through the transport zone and into the high-concentration P-type region to separate the high-resistivity N-type region of the transport zone into a surface portion and a lower portion; and

conductors of like metallic material forming first, second and third terminals in contact with the upper surface, the first terminal forming a Schottky barrier contact with the high resistivity N-type region, the second terminal forming an ohmic contact with the high-concentration N-type



region, the third terminal forming a Schottky barrier contact with the high-resistivity surface portion of the transport zone and forming an ohmic contact with the high-concentration P-type region, wherein the depth of said high-resistivity P-type region is such that it is not fully depleted in the zero bias condition of said third terminal Schottky barrier contact;

whereby an NPN switch transistor, an NPM clamp transistor and a Schottky barrier output diode are defined, wherein the high-resistivity N-type region in combination with the low-resistivity N-type region defines the collector of the switch transistor and the emitter of the clamp transistor as well as the cathode of the output diode, the high-concentration P-type region defines the base of the switch transistor, the high-concentration N-type region defines the emitter of the switch transistor, the high-resistivity P-type region defines the base of the clamp transistor, and wherein the portion of the third terminal contacting the high resistivity surface portion of the transport zone defines the collector of the clamp transistor.

4,405,935

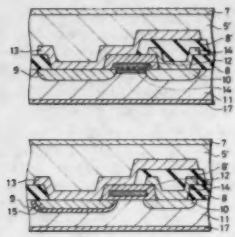
SOLID-STATE IMAGING DEVICE

Toru Baji, Kokubunji; Norio Koike, Tokyo; Toshihisa Tsukada, Sekimachi; Iwao Takemoto, Hinodemachi; Hideaki Yamamoto, and Yukio Takasaki, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,679
Claims priority, application Japan, Jan. 23, 1980, 55-5756
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—31 **6 Claims**

1. A solid-state imaging device comprising: a semiconductor integrated circuit in which a plurality of switching elements are disposed on a semiconductor substrate, the switching elements being adapted for selecting positions of picture elements; a photoconductive film which is disposed over the integrated circuit and which is connected to one end of each of the

switching elements; and a light transmitting electrode which is disposed on the photoconductive film; each of the switching elements including first and second impurity regions in the semiconductor substrate which have a conductivity type opposite to that of the semiconductor substrate, one of the impurity regions acting to store carriers generated with incidence of



light; and means for controlling current in a current path between the two impurity regions; wherein the breakdown voltage (BV_j) of the junction which is formed between said semiconductor substrate and the impurity region which stores carriers generated with incidence of light is made smaller than the breakdown voltage (BV_{DS}) between said first and second impurity regions.

4,405,936

METHOD OF AND ARRANGEMENT FOR DIGITIZING A COLOR VIDEO SIGNAL

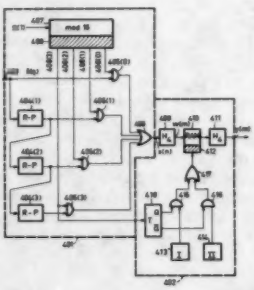
Joseph H. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 288,231

Claims priority, application Netherlands, Aug. 8, 1980, 8004521

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—13 **2 Claims**



1. A method of digitizing a color video signal which is formed by a sequence of line signals each comprising a superposition of a brightness signal and two color information signals u(t) and v(t) which are each formed by a color difference signal modulated on subcarrier with a color subcarrier frequency f_{sc}, the method comprising the following steps:

(a) sampling the color video signal with a sampling frequency f_s which is equal to twice the color subcarrier frequency f_{sc} and at instants which coincide with the phase points $\pm\pi/4+M\pi$ of the color information signal u(t) in the line signal, M representing an integer, to generate video signal samples x(n);

(b) forming a subpicture comprising Q video groups which are each formed by a sequence of P video signal samples of the relevant line signal and are associated with Q consecutive line signals;

(c) converting such a subpicture into a group of coefficients consisting of N coefficients y(m) which are each equal to the sum of versions of the subpicture video signal samples which have been weighted with a factor $+1$ or -1, wherein $m=0, 1, 2, -N-1$ and wherein N is equal to the product of P and Q; and

(d) converting each of the coefficients y(m) into a code word z(m) which comprises a number of bits assigned to the relevant coefficient.

4,405,937

CHROMINANCE SIGNAL REPRODUCING APPARATUS

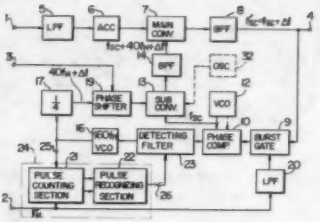
Mitsuru Kudo, and Isao Nakagawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,275

Claims priority, application Japan, Jul. 4, 1980, 55-90646

Int. Cl.³ H04N *5/93, 9/493*

U.S. Cl. 358—40 **7 Claims**



1. A chrominance signal reproducing apparatus comprising:

a reproduced-video signal input terminal;

a low-pass filter connected to said input terminal to produce a low-frequency converted carrier chrominance signal;

a first voltage-controlled oscillator oscillating at a first frequency;

a second voltage-controlled oscillator oscillating at a second frequency;

a frequency divider for dividing the output frequency of said first voltage-controlled oscillator;

a sub frequency converter circuit for producing the sum of the output frequencies of said frequency divider and said second voltage-controlled oscillator;

a main frequency converter circuit for frequency-converting the low-frequency converted carrier chrominance signal from said low-pass filter to produce a difference component, by the application of the sum frequency from the sub frequency converter circuit;

a burst gate supplied with the difference component from the main frequency converter circuit to produce a color burst signal;

a phase comparator for comparing the phases of the outputs from said burst gate and said second voltage-controlled oscillator to supply a phase difference signal to said first voltage-controlled oscillator, thus controlling its oscillation frequency; and

a frequency discriminator for counting the output frequency of said first voltage-controlled oscillator for a predetermined time and applying a control voltage to said first voltage-controlled oscillator, depending on the count value;

said frequency discriminator operating only when the frequency of the frequency converted carrier chrominance signal from said main frequency converter is deviated $\pm\frac{1}{2}f_H$ wherein f_H horizontal synchronizing frequency or above with respect to the carrier chrominance signal, to apply a control voltage to said first voltage-controlled

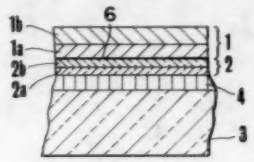
oscillator thereby driving the deviation in the range of $\pm \frac{1}{2} f_H$.

4,405,938

IMAGE PICKUP TUBE FACEPLATE STRUCTURE

Saburo Nobutoki, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,810
Claims priority, application Japan, Jun. 16, 1980, 55-80203
Int. Cl.³ H04N 9/04
U.S. Cl. 358—44 6 Claims



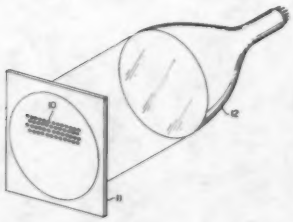
1. In an image pickup tube having a color separation filter mainly comprising organic materials, an inorganic transparent conductive film and an inorganic photoconductive film sequentially laminated in the order named on the central part of a transparent glass faceplate, the improvement wherein the inorganic transparent conductive film and the inorganic photoconductive film are non-porous and the transparent conductive film and the photoconductive film have areas greater than the area of the color separation filter to completely cover the color separation filter for isolating said organic materials from the inner vacuum of said tube.

4,405,939

METHOD FOR MAKING A DIRECTION SENSITIVE CONTRAST ENHANCEMENT FILTER

Mitchell Aron, Harrington Park, and Emanuel Sosinsky, Teaneck, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Oct. 30, 1981, Ser. No. 316,465
Int. Cl.³ H04N 9/16
U.S. Cl. 358—65 7 Claims



1. A method for making a direction sensitive contrast enhancement filter from a planar piece of material to provide unnoticeable moire pattern interference when used with a shadow mask color cathode ray tube (CRT) display having a phosphor dot size substantially 0.130 millimeters diameter in high ambient light environments comprising the steps of:

(1) determining the center-to-center spacing and radius of a plurality of holes to be placed through said planar piece of material in making said filter by performing the substeps of:

(a) selecting a curve of a particular Ratio A in FIG. 7 of the drawings, where Ratio A equals the center-to-center spacing between filter holes divided by the radius of a filter hole, the valley or minimum point of said selected curve indicating a percent variation in light output and a filter hole size accordingly,

(b) locating the point on a curve in FIG. 8 of the drawings having the same Ratio A and filter hole radius as selected and indicated in substep (a) to determine the transmission ratio of a filter having holes of such radius and Ratio A, said transmission ratio being an indicator of the amount of light generated by said CRT that will pass through said filter,

(c) determining if the transmission ratio indicated in substep (b) is acceptable, and if said transmission ratio is acceptable going to Step (2),

(d) when said transmission ratio is unacceptable as determined in Substep (b), selecting another curve on FIG. 7 having a new Ratio A, said new Ratio A having a lower numerical value to increase said transmission ratio and said Ratio A having a higher numerical value to decrease said transmission ratio, the minimum or valley of the curve in FIG. 7 for said new Ratio A indicating a new filter hole radius which along with said new Ratio A indicates a corresponding new transmission ratio on FIG. 8; and

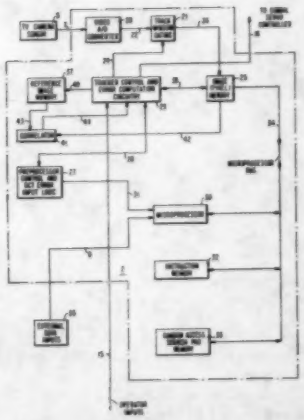
(2) producing holes through said planar piece of material to convert same to said direction sensitive contrast enhancement filter, each hole having the radius as determined by either Substeps (c) or (d) of Step (1) above, with all holes being equidistant, and the center-to-center spacing of said holes being determined by multiplying said Ratio A determined by either Substeps (c) or (d) of Step (1) above, by the filter hole radius determined from Steps (1) and utilized in producing said holes.

4,405,940

APPARATUS AND METHOD FOR PREPROCESSING VIDEO FRAME SIGNALS

Martin G. Woolfson, Baltimore, and John G. Romanski, Kingsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 802,086
Int. Cl.³ H04N 7/18
U.S. Cl. 358—93 24 Claims



1. Apparatus for preprocessing the video content of video frame signals generated sequentially by an electro-optical sensor for discriminating a target image therefrom, comprising:

means for selecting a predetermined portion of video signal from each video frame signal;

means for dividing the selected predetermined portion of each video frame signal into a predetermined number of elements, said elements being indexed in accordance with

their corresponding time dependent positions within the predetermined portion of video signal;

means for assigning to each element a gray level value selected from a plurality of discrete gray level values as a measure of the video content thereof;

means for segregating the elements of the predetermined portion of a selected video frame signal into inner and outer portions with respect to their time dependent position index;

means for classifying the elements of the outer portion as a function of their assigned gray level values;

means for classifying the elements of the inner portion as a function of their gray level values;

means for generating a discriminant function of gray level values based on the gray level classification of elements of the inner and outer portions;

means for selecting from the selected predetermined portion of each video frame signal only those elements having assigned gray level values corresponding to that of the discriminant function generated from the selected video frame signal; and

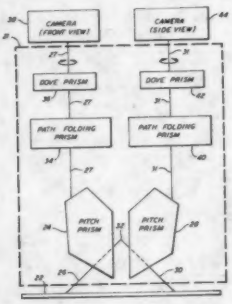
means for replacing the video content of the selected predetermined portion of each video frame signal with only the video content of the elements selected therefrom corresponding to the indexed position thereof, whereby the composition of the selected elements represents, at times, a substantial image of the target within the predetermined portion of each video frame signal.

4,405,941

OPTICAL PROBE

Richard A. Mecklenborg, Conklin, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,801
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—104 **27 Claims**



1. An optical probe, for use in a camera model system, and which is capable of generating both front and side views comprising:

(a) first means for defining a first aperture having a field of view corresponding to said front view and an external first apparent pupil;

(b) second means for deviating the direction of radiation passing through said first aperture;

(c) third means for defining a second aperture having a field of view corresponding to said side view and an external second apparent pupil;

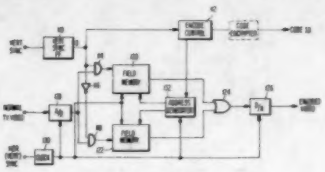
(d) fourth means for deviating the direction of radiation passing through said second aperture; said first and second pupils being located substantially at the same location and external to said first and second means respectively, whereby images corresponding to a front view and side view from said location are provided.

4,405,942

METHOD AND SYSTEM FOR SECURE TRANSMISSION AND RECEPTION OF VIDEO INFORMATION, PARTICULARLY FOR TELEVISION

Robert S. Block, Marina Del Ray, Calif., and John R. Martin, Milwaukee, Wis., assignors to Telease, Inc., Los Angeles, Calif.

Continuation of Ser. No. 124,656, Feb. 25, 1981, abandoned.
This application Mar. 3, 1982, Ser. No. 354,376
Int. Cl.³ H04N *7/16*; H04K *1/04*
U.S. Cl. 358—119 **40 Claims**



1. A method for transmitting a television video signal in a nonstandard form comprising the steps of:

(a) sequentially storing signals representing discrete samples of the video signal for one horizontal line in a first storage device;

(b) transferring the stored signals for the one horizontal line from the first storage device into a second storage device while simultaneously modifying the stored signals to form an encoded video signal;

(c) retrieving the stored signals from the second storage device; and

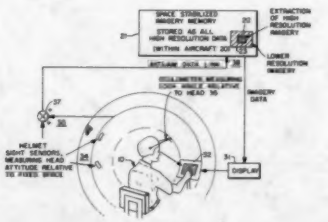
(d) transmitting the encoded video signal.

4,405,943

LOW BANDWIDTH CLOSED LOOP IMAGERY CONTROL AND COMMUNICATION SYSTEM FOR REMOTELY PILOTED VEHICLE

David B. Kanaly, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 19, 1981, Ser. No. 294,190
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—133 **47 Claims**


SPACE STABILIZED IMAGERY MEMORY
STORED AS ALL HIGH RESOLUTION DATA WITHIN AIRCRAFT
EXTRACTION OF HIGH RESOLUTION IMAGERY
LOWER RESOLUTION IMAGERY
IMAGERY DATA
TO HEAD 35
HELMET SIGHT SENSORS MEASURING HEAD ATTITUDE RELATIVE TO FIXED SPACE
DISPLAY

1. A system for displaying, at a local station a high resolution image of a portion of scene optically imaged at a remote station comprising:

at said remote station,

a memory;

first means for generating high resolution data representative of said optically imaged scene to be displayed and storing said data in said memory;

second means for selectively accessing said memory to read out therefrom a first portion of said data as high resolution image information and a second portion of said data as low resolution image information; and

third means for transmitting signals corresponding to said first portion of said data containing said high resolution

image information and said second portion of said data containing said low resolution image information to said local station; and

at said local station,

fourth means for generating signals representative of a prescribed portion of said scene for which a high resolution image is to be displayed; and

fifth means for transmitting signals representative of the signals generated by said fourth means to said remote station to cause said second means to selectively access said memory to read out therefrom as high resolution image information that portion of said data corresponding to said prescribed portion of said scene.

4,405,944

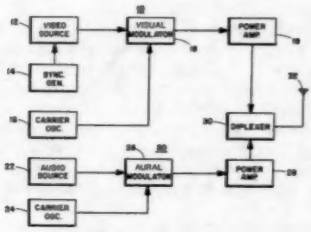
TV SOUND TRANSMISSION SYSTEM

Carl G. Eilers, River Forest, and Pieter Fockens, Glenview, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 196,491, Oct. 14, 1980, Pat. No. 4,339,772. This application Mar. 12, 1982, Ser. No. 357,520

Int. Cl.³ H04N *5/40, 5/44*

U.S. Cl. 358—144 **22 Claims**



1. In a television signal transmitter of the type having a signal source defining a horizontal scanning line frequency and means for generating an audio transmission signal comprising a main carrier signal frequency modulated by a composite modulation function, the improved apparatus for developing said composite modulation function comprising:

means for developing first and second stereophonically related audio signals;

means for developing a third audio signal;

means for developing first and second subcarrier signals having frequencies equal to two and five times said horizontal scanning line frequency respectively;

means for developing a first modulation function component comprising the sum of said stereophonically related audio signals;

means for developing a second modulation function component comprising a double sideband suppressed carrier signal formed by amplitude modulating said first subcarrier signal in accordance with the difference between said stereophonically related audio signals;

means for developing a third modulation function component comprising said second subcarrier signal frequency modulated in accordance with said third audio signal; and

means for combining said first, second and third modulation function components for producing said composite modulation function.

4,405,945

SYNCHRONIZING SIGNAL DETECTOR CIRCUIT

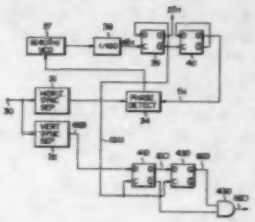
Kenzi Sato, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 19, 1982, Ser. No. 350,148

Claims priority, application Japan, Sep. 17, 1979, 54-128405

Int. Cl.³ H04L *7/00;* **H04N** *5/08;* **H03K** *17/28*

U.S. Cl. 358—154 **3 Claims**



1. A synchronizing signal detector circuit comprising:

a first synchronizing signal separator circuit for separating aifrst synchronizing signal from a composite synchronizing signal in which first and second synchronizing signals are included;

a second synchronizing signal separator circuit for separating the second synchronizing signal from the composite synchronizing signal;

an AFC loop for generating therein a signal synchronized in phase with the first synchronizing signal;

a first synchronous flip-flop which receives, as a clock pulse, the signal generated by said AFC loop and synchronized with the first synchronizing signal, and, as an input, the second synchronizing signal;

a second synchronous flip-flop which receives, as an input, the output of said first flip-flop, and operates in synchronism with the clock pulse; and

a logical product operation circuit for performing a logical product operation between outputs of said first and second flip-flops.

4,405,946

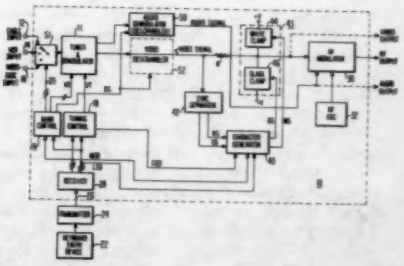
TELEVISION SIGNAL CONVERTING APPARATUS PROVIDING AN ON-SCREEN TUNING DISPLAY

Stanley P. Knight, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 348,675

Int. Cl.³ H04N *5/50*

U.S. Cl. 358—192.1 **9 Claims**



1. A signal converting apparatus for television signals comprising:

input means including RF input means for providing a plurality of modulated RF carriers;

tuning and demodulating means for selecting one of said modulated RF carriers and for developing a video signal from said selected modulated RF carrier in response to a carrier selection control signal;

selection means coupled to said tuning and demodulating means for generating said carrier selection control signal;

detection means for developing a synchronization signal responsive to said video signal;

character generator means responsive to said carrier selection control signal and to said synchronization signal for generating a character signal identifying the selected one of said RF carriers;

combining means for combining said video signal and said character signal; and

modulating means for modulating said combined video and character signals on a second radio frequency carrier signal.

4,405,947

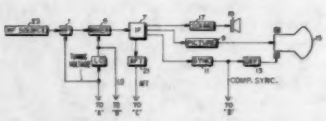
DUAL SEARCH MODE TYPE TUNING SYSTEM

Juri Tults, and Michael P. French, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 261,450

Int. Cl.³ H04B *1/16*; H04N *5/50*

U.S. Cl. 358—193.1 **12 Claims**



1. In a television receiver including RF means for selecting an RF signal from among a plurality of RF signals associated with respective channels which may be selected, local oscillator means for generating a local oscillator signal, mixer means for generating an IF signal by heterodyning said selected RF signal and said local oscillator signal, automatic fine tuning (AFT) means responsive to said IF signal for generating an AFT signal representing the deviation between the frequency of the picture carrier of said IF signal and its nominal value, and synchronization processing means for generating a picture synchronization signal in response to said IF signal, apparatus comprising:

tuning control means for controlling the frequency of said local oscillator signal including step means for changing the frequency of said local oscillator signal in steps;

first search means coupled to said step means and responsive to said synchronization signal for causing said step means to change the frequency of said local oscillator signal in steps from a first value toward a second value in a first frequency range until said synchronization signal has a predetermined condition or the frequency of said local oscillator signal has said second value;

second search means coupled to said step means and responsive to said AFT signal for causing said step means to change the frequency of said local oscillator signal in steps from a third value toward a fourth value in a second frequency range substantially the same as said first range until said AFT signal has a predetermined condition or the frequency of said local oscillator signal has said fourth value; and

search mode control means for first enabling the operation of said first search means and thereafter enabling the operation of said second search means if the frequency of said local oscillator signal reaches said second value under the control of said first search means.

4,405,948

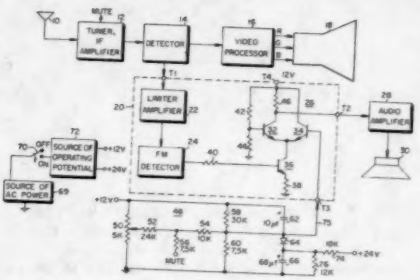
VOLUME CONTROL SIGNAL COUPLING CIRCUIT IN AN AUDIO SIGNAL PROCESSING SYSTEM

Patrick D. Griffis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,896

Int. Cl.³ H04N *5/60*

U.S. Cl. 358—198 **22 Claims**



10. In a television receiver responsive to received composite television signals corresponding to plural color television signal channels, said receiver including means for processing video components of said television signal, tuner means for selectably rendering said receiver responsive to individual ones of said television channels and providing a sound muting signal during channel changing intervals when said receiver is being tuned from one channel to another; and means for processing a sound component of said television signal, said sound processing means comprising:

a gain controlled amplifier having a signal input for receiving said sound component of said television signal, a gain control input, and a signal output;

sound reproducing means responsive to audio output signals from said amplifier for reproducing said sound component;

means for generating a gain control signal suitable for controlling the signal gain of said amplifier;

means for coupling said gain control signal to said gain control input of said amplifier via a coupling path;

means selectively operative for supplying operating potentials to said amplifier and to said generating means when said system is energized, and for removing said operating potentials when said system is de-energized, said operating potentials including an undesired transient component appearing momentarily when said system is initially energized, and a steady-state component appearing at other times when said system is energized;

a first capacitor defining a transient signal current path between said gain control signal coupling path and a first operating potential;

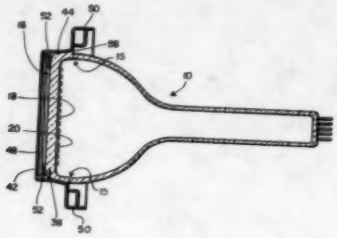
a second capacitor and a threshold conduction device responsive to said transient component for defining a selectively operative transient signal current path between said gain control path and a second operating potential; and wherein

said sound muting signal is coupled to said gain control input of said amplifier via said gain control signal coupling path.

4,405,949
LIQUID COOLING IN PROJECTION CATHODE RAY TUBES

Richard L. Hockenbrock, Mundelein, and Paul Strauss, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 22, 1982, Ser. No. 360,741
Int. Cl.³ H04N *5/74*
U.S. Cl. 358—237 **4 Claims**



1. Cooling means for cooling the face panel of a projection cathode ray tube, said face panel including a window section and a rearwardly extending flange having a forwardly tapering section, and a cathodoluminescent screen on the inner surface thereof for forming a television image, said cooling means comprising:

a housing having a rearwardly extending flange with a forwardly tapering section configured to nest with the forwardly tapering section of the face panel when mated therewith, said housing having a window section for framing and passing said image, and including tube mounting ears in the corner regions thereof for supporting said cathode ray tube;

spacing means for spacing said window section of said housing from said face panel window section

bonding means for bonding and sealing said tapering sections together;

a cooling medium located in the space between said windows for cooling the entirety said face panel;

such that said tapering sections provide for mechanically attaching said housing and said tube into firm exact adjacency for sealing, in conjunction with said bonding means, said housing to said face panel, and for physically supporting said tube in conjunction with said mounting ears.

4,405,950
TELEVISION DISPLAY SYSTEM HANDLING AND ADJUSTMENT APPARATUS

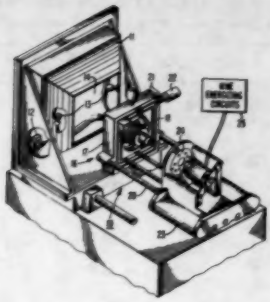
Myron H. Wardell, Jr., Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 15, 1981, Ser. No. 264,211
Int. Cl.³ H04N *5/64*; G01R *31/22*; H01J *9/44*; H01F *1/00*
U.S. Cl. 358—248 **4 Claims**

1. An apparatus for positioning a deflection yoke on the neck of a color television kinescope to converge a plurality of electron beams on the face of said kinescope, comprising:

a yoke holder coupled to one end of said yoke, said yoke holder comprising a rigid member and a flexible member disposed between said rigid member and said yoke; and

means for moving said yoke holder in a direction transverse with respect to said kinescope neck through a first distance in which both ends of said yoke are free to move with respect to said kinescope neck and in the same transverse direction through a second distance such that the end of said yoke remote from said yoke holder contacts said kinescope at a contact point, causing said yoke to pivot about said contact point, movement of said yoke through said first and second distances converging said beams from a first and second misconverged condition, respectively, said pivoting of said yoke causing the shape of said yoke holder flexible member to distort in order to

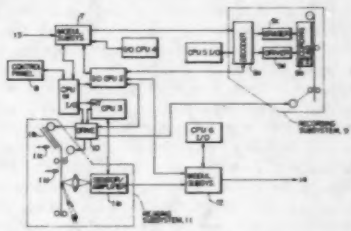


maintain said yoke holder rigid member in orthogonal alignment with respect to said kinescope neck.

4,405,951
FACSIMILE CONTROL SYSTEM

Takashi Omori; Kenji Koguchi, both of Kanagawa; Masahiko Yamagishi, and Higehumi Takeuchi, both of Nagano, all of Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Dec. 17, 1980, Ser. No. 217,304
Claims priority, application Japan, Dec. 18, 1979, 54-163599
Int. Cl.³ H04N *1/32*
U.S. Cl. 358—256 **3 Claims**



1. A facsimile system, comprising:

a first microcomputer (CPU M) functioning as a master microcomputer coupled through input/output ports thereof to control system drive control means, said drive control means being coupled through input/output ports thereof to a second microcomputer (CPU 3) functioning as a slave microcomputer, said second slave microcomputer being coupled through halt/reset inputs thereof to said master microcomputer;

a reading subsystem, controlled through input ports thereof connected to said drive control means, comprising a sensor/amplifier, said sensor/amplifier being controlled through input/output port couplings thereof by said second microcomputer functioning as a slave microcomputer and being coupled through an output port thereof to a modulating subsystem; and

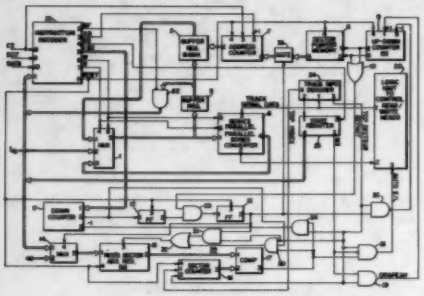
a third microcomputer functioning as a slave microcomputer coupled through an input port thereof to respond to said master microcomputer and through input/output ports thereof to monitor said drive control means and said modulating subsystem, said modulating subsystem being further responsive through input/output port couplings thereof to a fourth microcomputer serving as a slave microcomputer.

4,405,952

APPARATUS FOR DETECTING FAULTY SECTORS AND FOR ALLOCATING REPLACEMENT SECTORS IN A MAGNETIC DISC MEMORY

Gilbert Slakmon, Paris, France, assignor to CII Honeywell Bull, Paris, France

Filed May 25, 1979, Ser. No. 42,416
Claims priority, application France, May 26, 1978, 78 15763
Int. Cl.³ G11B 5/09
U.S. Cl. 360—49 **11 Claims**



1. Apparatus for detecting faulty sectors and for allocating replacement sectors in a magnetic disc memory connected to a central processing unit, each face of a disc included in the memory being divided into sectors of a circle and into concentric tracks on which are recorded or from which are recovered data which are transferred between the central processing unit and the magnetic disc memory, said disc memory being associated with: (a) adjusting means for each track and sector, (b) magnetic transducers positioned immediately opposite each face of the disc for recovering and recording data from the disc, and (c) means for temporarily storing data which are transferred between the central processing unit and the disc memory, the apparatus comprising first means for recording data on and recovering data from fault-free sectors, second means for detecting faulty sectors and for indicating the order in which faulty sectors are detected, addressing means for sectors of the memory, the first means, second means and addressing means being coupled with third means for assigning a number of replacement sectors equal to the number of detected faulty sectors, said means for assigning being activated at the end of a track address by the addressing means.

4,405,953

MAGNETIC RECORDING AND REPRODUCING DEVICE

Akira Inomata; Tsunao Hasegawa, and Yasushi Ohtake, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 174,389, Oct. 29, 1979. This application Oct. 26, 1981, Ser. No. 315,337
Claims priority, application Japan, Mar. 1, 1978, 53-23400; Oct. 4, 1978, 53-122899; Oct. 4, 1978, 53-122900; Oct. 5, 1978, 53-123071; Oct. 5, 1978, 53-123073; Oct. 5, 1978, 53-123074; Oct. 5, 1978, 53-123075
Int. Cl.³ G11B 5/45, 5/02
U.S. Cl. 360—65 **7 Claims**

1. A magnetic recording and reproducing device comprising:

a recording bias signal source;

means for setting a level of said recording bias signal in response to a first digital control signal;

a recording level adjusting signal source;

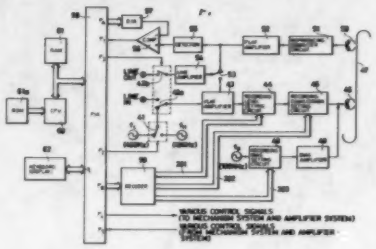
a recording equalization adjusting signal source;

switch means for selecting one of said recording level adjusting signal and said recording equalization adjusting signal;

amplifying means for amplifying the selected one of said recording level adjusting signal and said recording equalization adjusting signal;

recording level setting means for adjusting a level of an output of said amplifying means in response to a second digital control signal;

recording equalization setting means for setting the equalization of an output of said recording level setting means in response to a third digital control signal;



means for recording an output signal from said recording equalization setting means superposed on an output of said recording bias setting means on a recording medium;

means for reproducing signals recorded on said recording medium;

means for comparing a reproduced signal outputted by said reproducing means with a reference signal; and

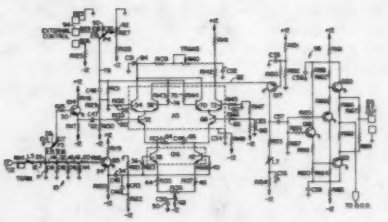
digital computing means for producing said first, second and third digital control signals in response to an output of said comparing means.

4,405,954

RADIO FREQUENCY EQUALIZER

Barrett E. Guisinger, Saratoga, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 324,773
Int. Cl.³ G11B 5/45, 5/02
U.S. Cl. 360—65 **12 Claims**



1. A circuit for selectively combining two or more input signals to produce a combined output signal in response to a control signal without introducing the control signal into the output signal, the circuit comprising

a first and a second amplifier circuit, each circuit having corresponding separate pairs of input stages and separate pairs of parallel connected, selectively gain controllable output stages driven by the input stages,

a combined output terminal,

a circuit ground,

means for connecting corresponding ones of the output stages of the first and second amplifier circuits to supply their outputs to the circuit ground and for connecting the other output stages of each amplifier circuit to supply their outputs to the combined output terminal,

means responsive to the control signal for controlling the

gains of opposite ones of the output stages of the first and second amplifier circuits, the other output stages having predetermined, fixed, gains,

means for supplying a first input signal to one of the input stages of both the first and second amplifier circuits, and

means for supplying a second input signal in inverted form to the other input stage of the first amplifier circuit and in non-inverted form to the other input stage of the second amplifier circuit.

4,405,955

VIDEO SIGNAL REPRODUCING APPARATUS

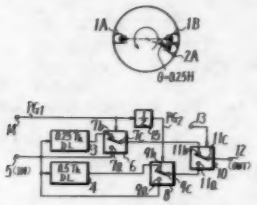
Hiroyuki Kaimai, Kawasaki; Masakazu Sonoda, Urawa; Masaaki Komatsu, Tokyo; Atsuo Sakai, Tokyo, and Toshimitsu Kamai, Higashikurume, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 269,428

Claims priority, application Japan, Jun. 4, 1980, 55-75299

Int. Cl.³ H04N *5/783*

U.S. Cl. 360—10.3 **8 Claims**



1. An apparatus for reproducing video signals recorded in successive parallel tracks extending at an angle to the length of a tape, comprising:

two main reproducing heads having different azimuth angles with respect to each other and disposed diametrically opposite each other;

at least one auxiliary reproducing head having the same azimuth angle as one of said main reproducing heads, said auxiliary reproducing head being disposed to be circumferentially displaced by (n+0.25)H' from the other of said main reproducing heads, where n is zero or a positive integer, and H' is an angle corresponding to one horizontal scan line on the tape;

head control means for controlling said main and auxiliary reproducing heads to reproduce said video signals with said main reproducing heads when the tape is transported lengthwise at a standard speed and to reproduce said video signals alternately with said one of said main reproducing heads and said auxiliary reproducing head when said tape is stopped; and

delay control means operative when said tape is stopped for relatively delaying the video signal reproduced by said one main reproducing head and the video signal reproduced by said auxiliary reproducing head so as to compensate for any variation in the periodicity of the horizontal synchronizing pulses which occurs upon a change in the reproduction of said video signals by said one of said main reproducing heads and said auxiliary reproducing head.

4,405,956

TRACKING APPARATUS FOR READ/WRITE HEAD

Sidney W. Marshall, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 22, 1981, Ser. No. 256,334

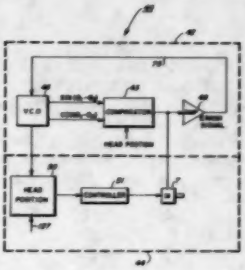
Int. Cl.³ G11B *21/10*

U.S. Cl. 360—78 **12 Claims**

1. In a tracking apparatus for locating the read/write head on a data recording disk, the disk having a plurality of data tracks separated into radially projecting data and servo sectors, the improvement comprising:

(a) a first series of positive and negative servo marks in each of said servo sectors, said servo marks being disposed so that each plus and minus servo mark pair has a data track therebetween;

(b) a second series of positive and negative servo marks in each of said sectors, said second servo marks being offset



from said first servo marks by one half a track, said first and second servo marks providing tracking signals that are 90° out of phase;

(c) means for reading said first and second servo marks, as said head moves relative to said disk to provide said tracking signals; and

(d) tracking means for locating the position of said head on said disk in response to said tracking signals.

4,405,957

PLUG-IN DEVICE FOR DISC-SHAPED RECORDING MEDIA IN A DRIVE

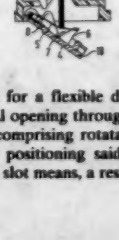
Guenther Vorbach Schwindegg, and Georg Böehmer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,622

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1980, 3021604

Int. Cl.³ G11B *5/016, 17/02*

U.S. Cl. 360—99 **13 Claims**



1. A drive apparatus for a flexible disc-shaped recording medium having a central opening through which said recording medium is driven, comprising rotatable drive means and means for loading and positioning said recording medium, including an introductin slot means, a resiliently mounted stop

member positioned across from said slot means, a pivotally mounted flap member for opening and closing said slot means, a spring element mounted on said flap member for pressing said recording medium against said stop member during closing of said flap member over said slot means for resilient loading and positioning of said recording medium for operation in said drive apparatus, and engagement means associated with said flap member for frictionally connecting said recording medium adjacent said central opening with said drive means as said flap member is closed.

4,405,958

MAGNETIC REPRODUCING APPARATUS WITH MAGNETORESISTIVE HEAD

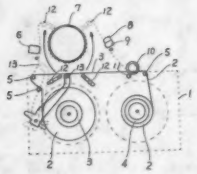
Masaya Hijikigawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 116,890, Jan. 30, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,633

Claims priority, application Japan, Jul. 19, 1979, 54-100482[U]

Int. Cl.³ G11B *5/12*

U.S. Cl. 360—113 **3 Claims**



1. In a magnetic-record reproduction system which selectively reproduces magnetic information signals recorded as a plurality of programs on a magnetic-tape including program selection means for selectively retrieving for reproduction a specific program from said plurality of programs, each program location being defined on said tape by associated magnetic cue signals on said tape, said magnetic tape having a record layer on which said magnetic information and cue signals are recorded and a base layer with a top surface contiguous to said record layer and a bottom surface opposite thereto and tape drive means for transporting the tape through said system the improvement comprising:

magnetoresistive detector means in contact with said bottom surface of said base layer for sensing said magnetic cue signals to said program selection means to enable the selective reproduction of said programs.

4,405,959

MAGNETIC HEAD FOR RECORDING AND READING MAGNETIC DATA WITH VARIABLE TRACK WIDTH

Jacques Chabrolle, Bagnolet, France, assignor to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Mar. 9, 1981, Ser. No. 242,157

Claims priority, application France, Mar. 11, 1980, 80 05418

Int. Cl.³ G11B *5/25, 5/27, 5/28*

U.S. Cl. 360—119 **11 Claims**

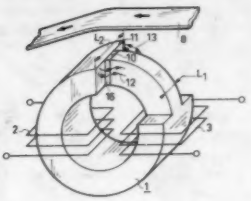
1. A magnetic head for recording and reading magnetic data, with variable track width, on a mobile support medium, comprising:

a magnetic circuit in ring form;

electric means for respectively applying and retrieving recording and reading signals;

an air gap provided in said magnetic circuit cooperating with the mobile support medium and delimited by two polar faces, of rectangular contour, disposed facing each other, with the respective dimensions of the two polar faces transversely to the plane of the ring being different, and with the greatest dimension determining, on the mobile support medium, the recorded width, and the smallest dimension determining the width read;

two ferromagnetic side-plates, respectively formed on each side of said polar face having the smallest dimension transversely to the plane of the ring and forming therewith a rectangular contour in order to provide a lateral field distributor in the air gap to increase the effective induction,



4,405,960

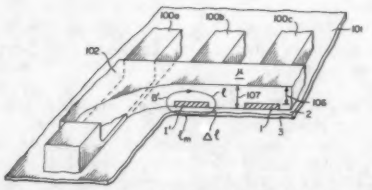
MAGNETOGRAPHIC RECORDING HEADS

George G. Pick, Mendham, and Houshang Rasekhi, Convent Station, both of N.J., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 1, 1981, Ser. No. 268,934

Int. Cl.³ G11B *5/16*

U.S. Cl. 360—125 **4 Claims**



1. A magnetic recording head formed using thin film metallization techniques for recording on a magnetizable medium responsive to a signal current applied to said head, and comprising:

a relatively flat, elongated conductor formed using said metallization techniques, said conductor having a reduced cross sectional area at a section of said conductor adjacent to said magnetizable medium and defining a recording zone thereat, said conductor having a first surface closest to said medium and a second surface furthest from said medium, and said current creating a magnetic field around said conductor which penetrates said medium and records thereon, and

a magnetic shunt made of high permeability, high remanence material which is contiguous to said second surface of said conductor at said reduced cross sectional area, said shunt being placed in a remanent magnetized state by applying a first current of sufficient magnitude to said conductor prior to said signal current being applied thereto, said signal current never being of a magnitude to place said shunt in its remanent magnetic state, said shunt allowing more flux lines to be created around said conductor in the recording zone than elsewhere around said conductor away from said recording zone, and the remanent magnetic field from said magnetized shunt introducing a prebiasing magnetic field into said medium to assist in recording thereon but of itself not having a magnetic field strong enough to effect recording on said medium, thus

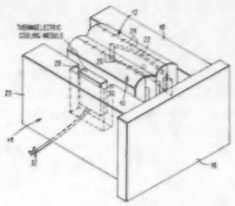
allowing lower magnitude signal currents in order to record on said medium.

4,405,961

THERMOELECTRIC COOLING OF MAGNETIC HEAD ASSEMBLIES

William W. Chow, Tucson; Davis S. Fields, Jr., Pima County; Paul Y. Hu, Pima County, and Jorge L. Lopez, Pima County, all of Ariz., assignors to International Business Machines, Armonk, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,646
Int. Cl.[3] F25B *21/02;* G11B *5/10, 5/40*
U.S. Cl. 360—129 8 Claims



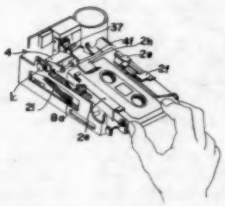
1. A magnetic head assembly comprising:
at least one magnetic head module;
a thermoelectric cooling element thermally coupled to said head module; and
a heat sink in thermal contact with said cooling element.

4,405,962

CASSETTE LOADING AND UNLOADING APPARATUS

Masao Haruta, Kawaguchi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 300,961
Claims priority, application Japan, Sep. 12, 1980, 55/127408; Sep. 12, 1980, 55/131022[U]
Int. Cl.[3] G03B *1/04;* G11B *15/00*
U.S. Cl. 360—96.6 14 Claims



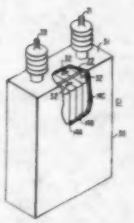
4. A cassette loading and unloading mechanism for use in an information signal recording and/or reproducing apparatus, comprising:
support means;
cassette holding means mounted on said support means and adapted to move between a first loading position and a second operative position, wherein a cassette is adapted to be inserted into said cassette holding means to a loaded position in response to a force applied to said cassette when said cassette holding means is in said first loading position;
retention means adapted to engage said cassette holding means to retain the latter in said first loading position;
first biasing means for biasing said cassette holding means to said second operative position from said first loading position when said retention means is disengaged from said cassette holding means; and
means for disengaging said retention means from said cassette holding means only after the cassette has been inserted to said loaded position and the force applied to said cassette has been reduced below a first value, said means for disengaging including threading arm means adapted to be biased from a first inactive position to a second active position by said cassette when the latter is inserted into said cassette holding means to said loaded position, release means for disengaging said retention means from said cassette holding means and adapted to be engaged by said threading arm means when the latter is biased to said second active position, and second biasing means for biasing said threading arm means from said second active position toward said first inactive position when said cassette has been inserted into said cassette holding means to said loaded position and when the force applied to said cassette has been reduced below said first value.

4,405,963

CAPACITOR APPARATUS WITH AN INDIVIDUAL DISCHARGE DAMPING DEVICE FOR EACH CAPACITOR UNIT

Barry L. Holtzman, Richland Township, Monroe County, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1981, Ser. No. 291,747
Int. Cl.[3] H02H *7/16*
U.S. Cl. 361—16 7 Claims

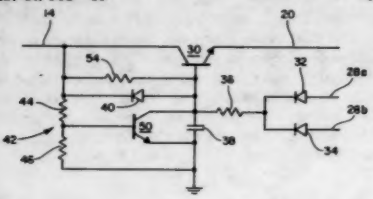


1. A capacitor unit comprising:
a stack of capacitor sections, each of said sections comprising a wound composite of dielectric sheet material and electrode material, said capacitor sections being interconnected and presenting a predetermined capacitance at first and second stack connection points;
said stack being contained within a closed housing having a pair of terminals extending therethrough;
a discharge damping device contained within said housing and connected between said first stack connection point and one of said pair of terminals, said discharge damping device comprising a predominantly resistive circuit path in parallel with a predominantly inductive circuit path for damping a high frequency discharge occurring across said terminals;
said predominantly resistive circuit path of said discharge damping device comprising a length of resistive conductor extending substantially directly between said first stack connection point and said one of said pair of terminals; and said predominantly inductive circuit path comprising a length of low resitance conductor looped within the space between said first stack connection point and said one of said pair of terminals.

4,405,964
OVER VOLTAGE CIRCUIT FOR A SWITCHING REGULATOR POWER SUPPLY

Jonathan L. Woods, and Leroy A. Sutton, both of Wheeling, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 29, 1982, Ser. No. 363,184
Int. Cl.³ H02H *3/20, 7/122*
U.S. Cl. 361—18 **11 Claims**



1. A protection circuit for a switching regulator power supply operable in response to a source of DC potential V_b for developing a bootstrap signal having a voltage level greater than V_b, said protection circuit comprising:

a series-pass transistor having a collector-emitter circuit connected between said source of DC potential and said power supply;

means for coupling said bootstrap signal to the base of said series-pass transistor;

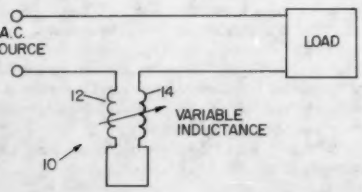
a shunting transistor having a collector-emitter circuit connected between the base of said series-pass transistor and a point of reference potential; and

a voltage divider connected between said source of DC potential and said reference potential for coupling a control voltage to the base of said shunting transistor, said control voltage causing said shunting transistor to be non-conductive for values of V_b less than a predetermined threshold value and to be conductive for values V_b greater than said predetermined threshold value so as to reduce the base drive of said series-pass transistor for limiting the DC potential supplied to said power supply to a safe level.

4,405,965
CURRENT LIMITING DEVICE FOR OVERCURRENT PROTECTION

William F. Weldon, and Herbert H. Woodson, both of Austin, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Dec. 21, 1981, Ser. No. 332,445
Int. Cl.³ H02H *9/02, 9/08*
U.S. Cl. 361—43 **7 Claims**



1. A current limiting device for an electric power system, comprising:

a first coil winding;

a second coil winding;

said coil windings being electrically connected for current flow therethrough, and magnetically linked for mutual inductive coupling;

said connected coil windings having an effective total inductance functionally related to their relative positioning;

said coil windings being disposed for relative movement, so as to provide for variation in the effective total inductance;

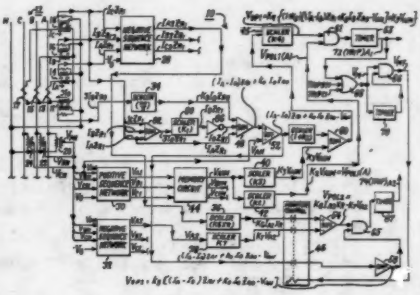
means for positioning said coil windings in an initial relative positioning to establish an initial effective total inductance; and

means for resisting movement of said coil windings under a force produced between said coils due to current flow therethrough, and for yielding to movement of said coils under a force produced between said coils due to a predetermined magnitude of current through the coil windings, so as to permit a change in relative positioning of the coils which acts to limit the flow of current therethrough.

4,405,966
SYSTEM FOR PROVIDING PROTECTION FOR A HIGH VOLTAGE TRANSMISSION LINE

Leonardo P. Cavero, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 7, 1981, Ser. No. 309,549
Int. Cl.³ H02H *3/26, 7/26*
U.S. Cl. 361—80 **6 Claims**



2. A phase selector relay for protecting one or more phases of one or more zones of a high voltage A.C. transmission line, said phase selector relay developing an operating signal V_{OPI} and a polarizing signal V_{POL1} for each phase of the transmission line and each representative of the current and voltage conditions existing in each phase, said phase selector relay further having a phase angle comparator comprising an AND circuit means and a TIMER means, said AND circuit means being responsive to the phase coincidence between the V_{OPI} and V_{POL1} signals for developing an output signal which is routed to and activates said TIMER means, said TIMER means generating a control signal upon the expiration of a predetermined time duration, said control signal being adapted to control circuit breaking means for causing said one or more phases of the one or more zones of the transmission line to be decoupled from the remainder of the transmission line, said phase selector relay further comprising means for developing said V_{OPI} and V_{POL1} signals respectively representative of the following relationships:

$$V_{OPI}=K_4[(1+K_5)(I_P-I_O)Z_{R1}+K_OI_OZ_{RO}-V_{PN}]+K_3V_{P1M} \quad (a)$$

where the subscript P shown for the current (I) and voltage (V) quantities is either A, B, or C to indicate the particular phase of the transmission line related to the particular phase of the V_{OPI} signal;

K_3, K_4, and K_5 are phase selector relay constants;

K_O is a zero-sequence line impedance compensation factor substantially equal to the amplitude of the quantity Z_{LO}/Z_{L1}, where Z_{LO} is equal to the zero-sequence line

impedance and Z_{L1} is equal to the positive-sequence line impedance;

I_O is the zero-sequence current flowing within the three (3) phase of the transmission line;

Z_{R1} is the replica positive sequence impedance of the transmission line;

Z_{RO} is the replica positive sequence impedance of the transmission line, but with the phase angle of the zero-sequence impedance of the transmission line;

I_P is representative of the current flowing in the transmission line related to the particular phase of the V_{OP1} signal;

V_{PLM} is the positive sequence component of a prefaulted transmission line voltage related to the particular phase of the V_{OP1} signal, and;

V_{PN} is the phase-to-neutral voltage of the transmission line related to the particular phase of the V_{OP1} signal;

$$V_{POL1} - K_2 V_{PLM} \quad (b)$$

where K_2 is a phase selector relay constant, and;

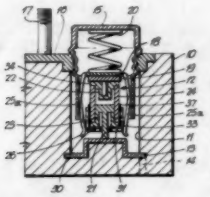
V_{PLM} is the positive sequence component of the prefaulted transmission line voltage related to the particular phase of the V_{POL1} signal.

4,405,967

GAS TUBE OVERVOLTAGE PROTECTOR WITH BACK-UP GAP

Casimir Cwirzen, Arlington Heights, Ill., assignor to Northern Telecom Inc., Nashville, Tenn.

Filed Dec. 4, 1981, Ser. No. 327,572
Int. Cl.³ H02H 9/06
U.S. Cl. 361—124 **10 Claims**



1. A gas tube overvoltage protector comprising:

a tubular dielectric housing;

two opposed electrodes sealed in said housing, said electrodes having opposed inner end surfaces defining a primary gap, said gap at a sub-atmospheric pressure;

said electrodes forming upper and lower electrodes and including outer ends extending from said dielectric housing;

an extension of reduced diameter extending axially from said outer end of the lower electrode;

a metal cap fitting over said dielectric housing at a lower end, said cap having an aperture, said extension extending through said aperture, there being a clearance between said cap and said extension sufficient to prevent electrical breakdown between the cap and the extension;

a thin dielectric member positioned between said metal cap and the adjacent outer end of the lower electrode, said extension passing through said dielectric member;

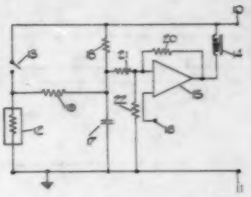
at least one aperture in said dielectric member, said aperture defining an auxiliary gap between said outer end of the lower electrode and said metal cap.

4,405,968

CONTROL CIRCUITS

Stephen A. White, London, England, assignor to Lucas Industries plc, Birmingham, England

Filed May 12, 1982, Ser. No. 377,587
Claims priority, application United Kingdom, May 28, 1981, 8116266
Int. Cl.³ H01H 47/18
U.S. Cl. 361—195 **3 Claims**



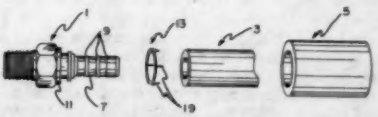
1. A control circuit for controlling the operation of an electrically powered heating device of the kind intended to be operated from a source of electric supply the terminal voltage of which can vary when the device is in use, the circuit comprising first and second terminals for connection to a source of d.c. supply, the first of said terminals in use being connected to one terminal of the heating device, the other terminal of the heating device in use being connected to the second of said terminals by way of switch means, a capacitor having one plate connected to said first terminal and its other plate connected to said second terminal by way of a first resistor, and in use, to the other terminal of said heating device by way of a second resistor, a comparator which compares the voltage developed across said capacitor with a reference voltage and a relay winding responsive to the output of said comparator for controlling the operation of said switch means.

4,405,969

ANTI-STATIC HOSE ASSEMBLIES

Donald F. Swavely, Kenhorst, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Oct. 2, 1981, Ser. No. 307,843
Int. Cl.³ H05F 3/00
U.S. Cl. 361—215 **4 Claims**



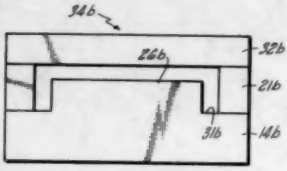
1. An anti-static hose assembly comprising a hose, an anti-static element enbedded between a cover and a tube of the hose, and a stem fitting mounted on the hose, the improvement comprising a conductive coupling ring seated between and in contacting relationship with the stem fitting and the hose: the conductive coupling ring having a plurality of tines extending away from the stem fitting and into the end of the hose in a region between the cover and the tube and into electrical contacting relationship with the anti-static element.

4,405,970

SILICON-GLASS-SILICON CAPACITIVE PRESSURE TRANSDUCER

James L. Swindal, East Hampton, and Daniel H. Grantham, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1981, Ser. No. 310,598
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 4 Claims



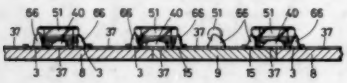
1. A silicon, capacitive pressure transducer comprising:
a first piece of conductive silicon having disposed thereon a pedestal, said pedestal having a conductive surface;
a second piece of conductive silicon having a conductive surface thereon; and
a wall of glass joining said first piece of silicon with said second piece of silicon and providing a chamber between said pieces and said wall, the conductive surface on said pedestal being spaced a short distance from the conductive surface of said second piece of silicon, forming the plates of a capacitor, said distance and therefore the capacitance of said capacitor varying in response to changes in fluidic pressure external to said transducer, the length of said wall between said pieces of silicon being at least four times greater than the distance between said capacitor plates.

4,405,971

ELECTRICAL CIRCUIT APPARATUS

Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 3, 1980, Ser. No. 212,529
Claims priority, application Japan, Dec. 10, 1979, 54-160049
Int. Cl.³ H05K 1/14
U.S. Cl. 361—401 3 Claims



1. Electric circuit apparatus comprising a mother board having a pattern of conductive leads disposed on a surface thereof and including at least one opening therein of predetermined size and shape; at least one daughter board of substantially the same size and shape as said opening, and being structurally distinct from said mother board, said daughter board being of substantially the same thickness as said mother board and being disposed in said opening, and said daughter board having a pattern of conductive leads disposed on a surface thereof; electrical circuit components mounted on said mother board and daughter board, and having electrodes electrically connected to the patterns of conductive leads of said mother and daughter boards; at least some of the patterns of conductive leads on said mother and daughter boards being electrically interconnected; and at least one of said electrical circuit components bridges the joint between said mother and daughter boards to provide electrical interconnection between a conductive lead on said mother board and a conductive lead on said daughter board and is substantially rigidly secured to both said boards to add mechanical strength to said joint.

4,405,972

CLAMP DEVICE FOR RETAINING PRINTED CIRCUIT BOARDS UNDER HIGH SHOCK CONDITIONS

Ermenegildo Fiorentino, Bridgeport; Edward A. Wojtowicz, Bryn Mawr, and Robert J. Leadlie, Frazer, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1982, Ser. No. 356,083
Int. Cl.³ H05K 7/12
U.S. Cl. 361—417 11 Claims

1. A clamp device for restraining a printed circuit board comprising:
a base member against which said printed circuit board is to be clamped,
at least one clamping bar having in its free unclamped state a clamping surface which exhibits a convex curvature when viewed from the direction of said printed circuit board,
fastener means for applying clamping forces to the respective extremities of said clamping bar of such magnitude that the curved clamping surface thereof is straightened and brought to bear against the surface of said printed circuit board,
said clamping bar exerting in its clamped state a substantially evenly distributed force to said printed circuit board, said last mentioned force being a function of the clamping forces required to straighten said curved clamping surface.

4,405,973

EMERGENCY LIGHT SOURCES

Thomas L. Moscarillo, 59 S. Village Green, Ipswich, Mass. 01938

Filed Mar. 2, 1981, Ser. No. 239,360
Int. Cl.³ F21K 2/00
U.S. Cl. 362—34 5 Claims

1. A light cell comprising a flexible plastic container including a generally dome shaped member, a generally flat base of transparent flexible plastic material sealed to the dome shaped member to form a liquid tight container, a frangible elongated glass pod containing a first chemiluminescence producing substance adapted to produce chemiluminescent light when mixed with a second substance substantially filling the container outside the pod, means including a pair of opposed indentations in the dome shaped member for retaining the pod against displacement from a position in which it may readily be ruptured by flexure of the container and means on the base

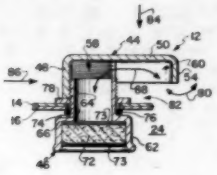
including an adhesive covering part of the base for attaching the cell to an article to be illuminated, whereby light is directed onto the article through the transparent base.

4,405,974

FILTER ASSEMBLY FOR LUMINAIRE

Honesto D. Quiogue, Blacksburg, Va., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Feb. 6, 1981, Ser. No. 231,990
Int. Cl.³ F21V *17/02*
U.S. Cl. 362—362 **12 Claims**



1. A filter assembly for a luminaire, comprising:

a fitting having an axially extending passageway opening at opposite ends thereof and a cavity receiving an air-permeable filter across said passageway; and

an elongated cap having a first portion coupled to said fitting to cover one end of said fitting passageway, a second portion extending laterally from said first portion and a solid back member extending over said first and second portions, said portions and back member defining a non-linear passageway in fluid communication with said fitting passageway, said fitting and cap being rotatably coupled, said first portion having a cylinder depending from said back member and a lateral slot communicating with said second portion, and said second portion being defined by said cylinder and lateral walls depending from said back member with said non-linear passageway opening in a direction generally parallel to and towards said fitting, said lateral walls extending from said back member to a lesser extent than said cylinder;

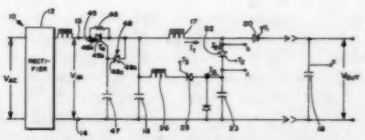
whereby, said cap can be adjustably positioned on the luminaire to maximize protection of said filter against damage from environmental conditions.

4,405,975

POWER SUPPLY START-UP CIRCUIT

Scott M. Overstreet, and C. Henning Swenson, both of Los Altos, Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,158
Int. Cl.³ H02M *3/135*
U.S. Cl. 363—49 **6 Claims**



1. In a power supply for electrical discharge apparatus comprising a source of DC voltage having first and second terminals and a storage capacitor connected across said terminals, a start-up circuit comprising

a bistable switch having a trigger terminal, said switch being connected to said storage capacitor and to said first terminal,

a shunt resistor connected across said switch,

a trigger capacitor connected between said second terminal and said trigger terminal, and

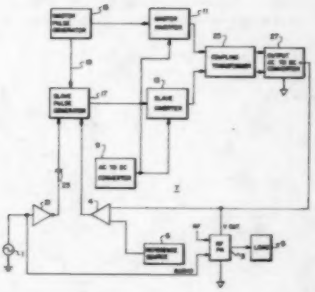
a diode having an anode and a cathode, said anode being connected between said storage capacitor and said switch, said cathode being connected between said trigger capacitor and said trigger electrode.

4,405,976

AUDIO TRACKING PULSE-WIDTH MODULATED POWER SUPPLY

Daniel M. Mitchell, Cedar Rapids, and William J. Durspek, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 16, 1981, Ser. No. 331,037
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—72 **15 Claims**



1. An audio signal tracking power supply, comprising:

master pulse generator means for generating master control pulses;

slave pulse generator means, responsive to the audio signal, for generating slave control pulses;

dc power supply means for providing dc power;

master inverter means for inverting a first part of the dc power to a first ac signal, the master inverter means being controlled by the master control pulses;

slave inverter means for inverting a second part of the dc power to a second ac signal, the slave inverter means being controlled by the slave control pulses; and

output converter means for converting the first and second ac signals to a dc output signal.

4,405,977

COMMUTATION CIRCUITS FOR THYRISTOR INVERTERS

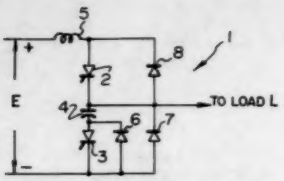
Pradeep M. Bhagwat, Baltimore, Md., and Victor R. Stefanovic, Charlottesville, Va., assignors to Canadian Patents and Dev. Limited, Ottawa, Canada

Filed Aug. 26, 1981, Ser. No. 296,296
Claims priority, application Canada, Sep. 25, 1980, 363141
Int. Cl.³ H02M *1/06, 7/515*
U.S. Cl. 363—124 **11 Claims**

1. In a thyristor circuit for applying a dc voltage through a thyristor to a load, a commutation circuit for the thyristor comprising:

inductance means, normally discharged capacitance means and a commutation thyristor connected in series with said thyristor;

a first diode connected in reverse polarity across the commutation thyristor; and



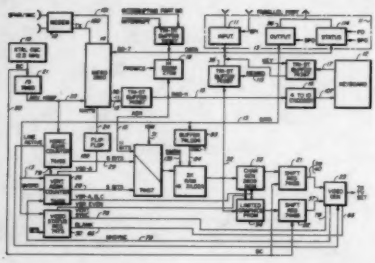
a second diode connected in reverse polarity across the series connected capacitance means and commutation thyristor.

4,405,978

MICROPROCESSOR BASED COMPUTER TERMINAL

Ronald E. Lange, and Steve E. King, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 25, 1979, Ser. No. 51,473
Int. Cl.³ G06F *3/023*
U.S. Cl. 364—200 **2 Claims**



1. A computer terminal apparatus for sending data to and receiving data from another data processing device comprising:

(a) a keyboard means for allowing entry of data and control signals by an operator;

(b) a port means for interfacing with said other data processing device so that data may be received from and sent to said other data processing device;

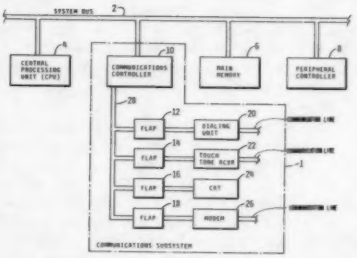
(c) logic means selectively coupled to said keyboard means and said port means, said logic means including means for scanning said keyboard means, means for receiving and encoding data and control signals therefrom, means for presenting data received by said computer terminal at an output thereof, and means responsive to a predetermined control signal received from said keyboard for simultaneously transmitting data being received from said keyboard out through said port means to said other data processing device, said logic means including a microprocessor programmed to effect the stated functions, said microprocessor having an address bus, a data bus and a control output signal, and where said computer terminal apparatus includes a decoder means for decoding signals on a portion of said address bus, and where said keyboard is comprised of a matrix of switches, one side of each column of said switches being connected to a scan line connected to one of the outputs of said decoder means, and each row in said matrix of switches having one side connected to a sense line, said apparatus also including a tri-state buffer having a plurality of inputs connected respectively to said sense lines and an output connected to said data bus, said tri-state buffer having a control input for receiving said control output signal from said microprocessor for connecting said sense lines to said data bus when said microprocessor effects the scan of said keyboard means, said scanning being effected by said microprocessor by sequentially addressing each said scan line and reading the output of said tri-state buffer via said data bus.

4,405,979

DATA PROCESSING SYSTEM HAVING APPARATUS IN A COMMUNICATIONS SUBSYSTEM FOR ESTABLISHING BYTE SYNCHRONIZATION

Thomas O. Holtey, Newton; Steven S. Noyes, Boylston, and James C. Raymond, Framingham, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 6, 1980, Ser. No. 194,495
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **7 Claims**



1. In combination with a communication line coupled to a communications subsystem, a data processing system comprising a system bus, at least one central processing unit (CPU), one main memory system, one peripheral controller and said communications subsystem, all coupled in common to the system bus, said communications subsystem including a communications controller coupled to said system bus, a plurality of flexible line adapters (FLAPs), each coupled to said communications controller, and further including typical communication devices such as a modem, a dialing unit, a touch-tone receiver, a cathode ray tube (CRT), a plurality of each of said typical devices coupled to one each of said FLAPs, an apparatus in said each of said FLAPs for establishing byte synchronization comprising:

(a) a U-bus and an M-bus coupled to each other, and further coupled to said system bus;

(b) a microprocessor (μP) coupled to said U-bus;

(c) a random access memory (RAM) coupled to said M-bus;

(d) a programmable read only memory (PROM) also coupled to said M-bus;

(e) a universal synchronous receiver (USRT) coupled to said U-bus for transmitting bytes of information read from said main memory to a selected one of said typical devices via said FLAPs, and receiving bytes of information from said selected one of said typical devices via said FLAPs for writing in said main memory, said bytes of information being transferred in a byte control protocol mode when one of said typical devices generates a sequence of byte timing pulses of which successive pulses are separated by one byte width; and

(f) synchronizing means included in said FLAPs and coupled to said USRT and to said typical devices, said synchronizing means synchronizing said bytes of information to the sequence of byte timing pulses.

4,405,980

PROCESS CONTROL COMPUTER WHEREIN DATA AND ADDRESSES ARE SEPARATELY PROCESSED

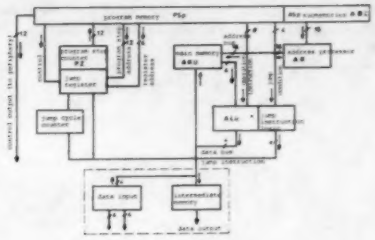
Bruno M. Hess, Am Born 16, 5451 Horhausen/Westerwald, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,361

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944757

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—200 24 Claims



1. A sequentially pulse-frequency driven process control computer, comprising

a data input/output unit;

an address memory;

a separate address processor;

an address bus;

a main memory directly connected to said data input/output unit and, via said address processor and said address bus, to said address memory;

a program memory;

a clock generator connected to said program memory and said address memory and supplying sequential clock pulses for the execution of the program and for the simultaneous delivery of addresses in each program step;

a data bus separate from said address bus;

an arithmetic logic unit, said main memory storing the data from said data-output unit after the feeding of the addresses from said address processor supplying the data for the program step to said arithmetic logic unit via said data bus, said arithmetic logic unit simultaneously receiving pulse-frequency driven operation commands from said program memory and feeding the operation results via said data bus to said data input/output unit and to said main memory for storing; and

a program step counter connected to said program memory and continuing switching of the program steps and controlling the output of the operation commands from said program memory.

4,405,981

COMMUNICATION MULTIPLEXER HAVING AN APPARATUS FOR ESTABLISHING A SINGLE LINE PRIORITY

Kin C. Yu, Burlington, Mass., and Angelo D. Kachemov, Plattsburgh, N.Y., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 29, 1980, Ser. No. 191,580

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—200 6 Claims

1. A data processing system for transferring data bytes comprising:

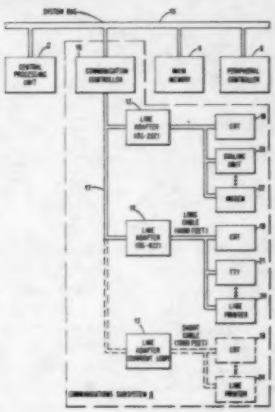
a system bus;

a main memory coupled to said system bus for storing said data bytes;

a communication multiplexer coupled to said system bus for transferring said data bytes between said main memory and a plurality of devices, each device coupled to said communication multiplexer and being enabled for operation in a receive and a transmit mode respectively in response to receive and transmit channel numbers from said communication multiplexer;

said communication multiplexer being operative in a synchronous mode with one of said plurality of devices and in an asynchronous mode with the remainder of said plurality of devices;

said communication multiplexer including polling means coupled to said system bus for first transferring each of said received channel numbers in a predetermined sequence to said system bus then transferring each of said transmit channel numbers in a predetermined sequence to said system bus, said predetermined sequence of said received channel numbers having a first priority and said predetermined sequence of said transmit channel numbers



having a second priority each of said received channel numbers and each of said transmit channel numbers being applied to said system bus for enabling the transfer of said data bytes between said main memory and each of said plurality of devices;

said communication multiplexer further including means responsive to a first received channel number when in said received mode and responsive to a second received channel number when in said transmit mode for enabling the transfer of said data bytes between said synchronous device and said main memory;

said polling means including multiplexer means coupled to said system bus for translating a transmit channel number of said synchronous device to said second received channel number.

4,405,982

ARRANGEMENT FOR MONITORING THE FUNCTION OF A PROGRAMMABLE ELECTRONIC SWITCHING CIRCUIT

Gerhard Ruhnau; Klaus Grubert, both of Hanover; Karl-Heinz Hesse, Gehrden, and Rudolf Auding, Hanover, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 198,698

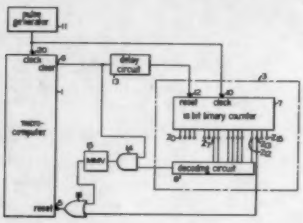
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946081

Int. Cl.³ G06F *9/22, 9/32*

U.S. Cl. 364—200 2 Claims

1. An arrangement for monitoring the normal time required to execute a program comprising, a programmable electronic control circuit for processing the program and having reset and clear terminals, a monitoring switching circuit for monitoring the time of the program, circuit electronic control cir-

cuit, said monitoring switching circuit includes a decoding circuit having a plurality of inputs, a pulse generator, said monitoring switching circuit includes a binary counter having a clock input and a plurality of outputs, means connecting said clock input to said pulse generator, means connecting said plurality of binary counter outputs to said plurality of inputs of said decoding circuit, a delay circuit, means connecting said delay circuit between a reset terminal of said binary counter and said clear terminal of said programmable electronic control circuit, an AND gate, means connecting an output of said decoding circuit and said clear terminal of said programmable electronic control circuit to said AND gate, a monostable multivibrator having an input, means connecting said input of



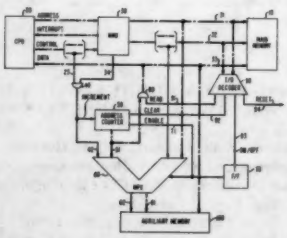
said monostable multivibrator to the output of said AND gate, a two-input OR gate, means connecting the output of the monostable multivibrator and the output of said binary counter which correspond to the maximum program period to the respective inputs of said OR gate, means connecting the output of the OR gate to said reset terminal of said programmable electronic control circuit, said programmable electronic control circuit having a clock input, and means connecting said clock input of said programmable electronic control circuit to said pulse generator for correlating a pulse count and for causing said binary counter to provide a pulse on said reset terminal of said programmable electronic control circuit when the normal time of the program is incorrect.

4,405,983

AUXILIARY MEMORY FOR MICROPROCESSOR STACK OVERFLOW

Pedro I. Perez-Mendez, Westminster, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1980, Ser. No. 217,571
Int. Cl.³ G06F *9/18*
U.S. Cl. 364—200 **7 Claims**



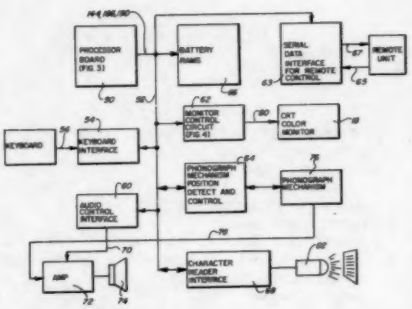
1. A computer system comprising
a central processing unit (CPU),
a main memory having protected areas of storage and unprotected areas of storage and a memory block of defined size in an unprotected area for storing CPU interrupt data,
an auxiliary memory,
means for detecting an attempt by the CPU to write data into a protected area of the main memory and for interrupting the CPU in response thereto,
means for detecting an overflow of the memory block occurring during the storing of interrupt data in the memory block, and
means responsive to the last-mentioned detecting means for writing the overflow data into the auxiliary memory.

4,405,984

COIN-OPERATED PHONOGRAPH

Lawrence Siegel, Chicago; Edward L. Polanek, Woodstock; Anthony J. Miller, Skokie, and Alan L. Woodman, Mount Prospect, all of Ill., assignors to Stern Electronics, Inc., Elk Grove Village, Ill.

Filed Feb. 2, 1981, Ser. No. 230,398
Int. Cl.³ G05D *29/00*; G07F *17/00*
U.S. Cl. 364—410 **9 Claims**



1. A coin-operated phonograph including a cabinet, coin-receiving means, means for playing selected sound recordings, means for customer selection of sound recordings to be played, a mechanism for detecting the customer's selection, for locating the sound recording and for relatively positioning the selected sound recording and playing means for playing of the selected sound recording, the improvement comprising, in combination:
(a) means for storing alphanumeric information to be displayed; said alphanumeric information being stored in digital form;
(b) means for entering the alphanumeric information into storage in said storage means;
(c) means responsive to said storage means for controlling the presentation of the alphanumeric information on electronic display means; and
(d) electronic display means for displaying the information in alphanumeric form.

4,405,985

GUIDANCE COMPUTER

Eldon C. Hall, Wollaston; Harold H. Seward; Joseph D. Sabo, both of Arlington; Vincent R. De Marco, Reading, all of Mass., and Millard B. Prisant, Bayside, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1965, Ser. No. 502,689
Int. Cl.³ G06F *15/14*
U.S. Cl. 364—423 **8 Claims**

1. A digital computer comprising:
timing means for generating
bit time pulses,
word time pulses so that said computer operates on a time-shared basis of M words each N bit in length;
pulses indicative of elapsed time from a start computation signal which is applied to said means from an external source;

a plurality of special pulses for use in said computer;

a decoder network having

means for substantially continually sampling at least M varying signals;

means for simultaneously comparing the most recent sampling of said signals with the present sampling of said signals and generating at least M output signals indicative of changes in said signals;

and

means for receiving said output signals indicative of changes and the bit timing signals from said timing means signals and generating at least M signals on a time shared basis suitable for use in said computer;

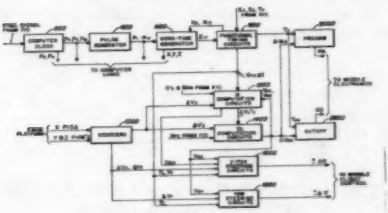
first computation circuits operatively connected to said timing means, and said decoder network;

a first binary adder operatively connected to said first computation circuits;

M serial shift register, each capable of storing N bits of information, and connected in series circuit arrangement one with the other, connected in a loop with said adder, and operatively connected to said input circuit;

means for reading M words, each N bits in length, into said registers, prior to the start of computation;

means for incrementally circulating the contents of said registers to said adder circuit which up-dates certain of said M words by a constant increment each addition and others of said words by a variable increment dependent upon an input signal received from said decoder network, and for returning said up-dated words to said registers on a time-shared basis, whereby said adder operates upon said words on a time-shared, real-time basis;



means for sensing the overflow from said adder circuit during certain of said M word times;

second computation circuits operatively connected to said timing means, decoder network and said overflow sensing means;

a second binary adder circuit operatively connected to said second computation circuits;

M serial shift registers each capable of storing N bits of information and connected in series arrangement one with the other, connected in a loop with said second adder circuit, and operatively connected to said input circuits, each of said registers having output means connected thereto;

means for reading M words, each N bit in length, into said registers prior to the start of computation;

means for incrementally circulating the contents of said registers to said adder circuit wherein said words are updated as a function of elapsed time, the outputs of said decoder network and said overflow sensing means on a time-shared, real-time basis;

third and fourth computation circuits each connected to said timing means, decoder network, first computation circuits and second computation circuits;

a full binary adder circuit connected to said third and fourth computation circuits, signals from said circuit applied as the addend to said adder;

a control register connected in a loop with said adder circuit;

means for initially reading information into said register and for incrementally shifting said information to said adder which information is the augend of said adder and shifting the sum back to said register;

means for holding a portion of the output of said adder if said sum is greater than the capacity of said register;

comparator means for substantially continually sampling the contents of said register and comparing said contents to a constant read into said means prior to flight;

means connected to said input circuit to change said constants upon receipt of a special signal from said timing circuits;

means connected to said comparator means for ;issuing command signals in response to said comparisons;

fourth and fifth computation circuits operatively connected to said timing means and said second computation circuit, which upon receipt of signals indicative of predetermined elapsed time and signals of less than a predetermined magnitude from said second computation circuits, issue output signals in response thereto.

4,405,986

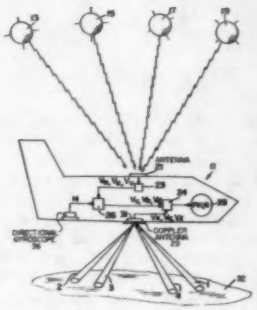
GSP/DOPPLER SENSOR VELOCITY DERIVED ATTITUDE REFERENCE SYSTEM

Jack Gray, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1981, Ser. No. 255,030

Int. Cl.³ G06F *15/50*; G06G *7/78*

U.S. Cl. 364—434 **4 Claims**



1. An attitude reference control system for a vehicle comprising:

a receiver/processor including:

an antenna for receiving ranging signals from a plurality of orbiting navigation satellites;

storage apparatus for storing signals representing ephemeris information relating to said satellites;

a correlator device providing range and range rate signals from said ranging signals and for correlating said range and range rate signals with said stored signals to provide signals representing the vehicle's velocity along the local meridian, V_n, its velocity along the local parallel of latitude, V_e, and its vertical velocity, V_v;

a directional gyroscope providing a vehicle heading reference signal, H;

a converter circuit connected to said receiver/processor and said directional gyroscope for correlating said local meridian velocity signal, V_n, and said local parallel velocity signal, V_e, with said heading reference signal, H, to provide signals representing the along-track velocity, V_h, and the cross-track velocity, V_d, of said vehicle;

axial velocity sensing apparatus for measuring and providing signal representing the vehicle's axial velocities, V_x, V_y and V_z along the roll, pitch and yaw axes, respectively;

a velocity correlator connected to said axial velocity sensing apparatus and said converter circuit for correlating said

along-track velocity and said cross-track velocity signals with said axial velocity signals to provide signals representing the instantaneous pitch and roll angles of said vehicles; and

apparatus connected to said velocity correlator for utilizing said pitch and roll angle signals for the navigation of said vehicle.

4,405,987

MEASURING PROCESSES AND APPARATUS FOR DETERMINING TARIFF VALUES FOR ENERGY CONSUMERS

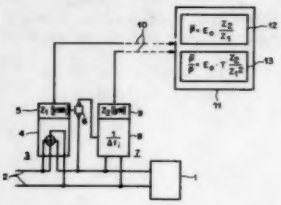
Alfred Spalti, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Continuation-in-part of Ser. No. 973,625, Dec. 27, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,867

Claims priority, application Switzerland, Dec. 29, 1977, 16167/77

Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—483 **18 Claims**



7. A measuring apparatus for determining a tariff value for energy consumed by an energy consumer during a period of energy consumption, said tariff being dependent on the power of said energy consumed, comprising a consumption meter for measuring energy consumed during said energy consumption period, a pulse generator associated with said consumption meter for producing fixed quantity pulses each of which pulses represents the consumption of a fixed quantity of energy, a measuring and calculating means for forming measurement value each time a fixed quantity pulse is produced proportional to the reciprocal of the time intervals between said fixed quantity pulse and the immediately preceding fixed quantity pulse, a summing means for summing said measurement values during said consumption period, and an evaluation means for forming the quotient of the said summed measurement values and the measurement value for said consumption period by dividing the said summed measurement values by the said measurement value; said summing means and said consumption meter being in communication with a common evaluation means by way of communication channel, said quotient representing said tariff value for said consumption period.

4,405,988

PROCESS AND DEVICE FOR MONITORING THE FUNCTIONING OF A LIQUID-LIQUID EXTRACTION COLUMN

Michel Forster, Valence; Adrien Jaouen, Champigny; Alain Jorda, Massy, and Pierre Rampin, Valence, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 9, 1981, Ser. No. 241,472

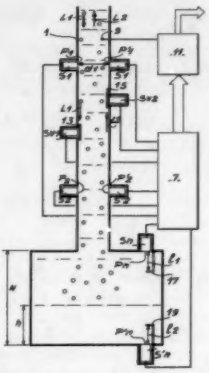
Claims priority, application France, Mar. 12, 1980, 80 05526

Int. Cl.[3] **G01F** *1/66*

U.S. Cl. 364—502 **12 Claims**

1. Process for monitoring the functioning of a liquid-liquid extraction column in which two non-mixing liquids, constituted respectively by a heavy liquid L1 and a light liquid L2, circulate in countercurrent, said process comprising the following steps of:

determining the time t taken by an ultrasonic signal to propagate in the column from a point P to a point P' located at a distance d from point P,



determining the speeds v_1 and v_2 of propagation of this ultrasonic signal in the liquid L1 and in the liquid L2 respectively, and

calculating from this time t, the distance d and the speeds v_1 and v_2 thus determined, the voluminal fraction ϵ_1 of the liquid L1 and/or the voluminal fraction ϵ_2 of the liquid L2 from the formula:

$$\epsilon_1 = \frac{v_1}{d} \cdot \frac{v_2 t - d}{v_2 - v_1} \text{ and } \epsilon_2 = \frac{v_2}{d} \cdot \frac{v_1 t - d}{v_1 - v_2}.$$

4,405,989

SPECTRAL MONITORING DEVICE FOR BOTH PLASMA ETCHING AND SPUTTERING

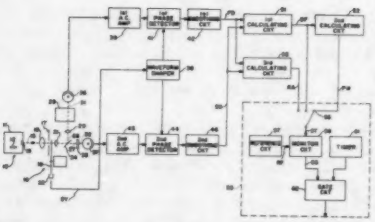
Tsutomu Tsukada, and Katsumi Ukai, both of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,368

Claims priority, application Japan, Mar. 24, 1980, 55-36256

Int. Cl.[3] **H01L** *21/306;* **H03K** *5/18;* **G06F** *15/46*

U.S. Cl. 364—525 **7 Claims**



1. A monitoring device operated responsive to a single light beam which is produced in a chamber of a layer processing device, said chamber including a source of plasma which proceeses said layer in gradual status changes, said device monitoring the instantaneous changes in status of said layer, said gradual status changes resulting from gradual variations of thickness of said layer, said light beam including a first component in a first spectrum region and a second component in a second spectrum region which is different from said first spectrum region, said monitoring device comprising:

beam splitting merans for splitting said beam according to said first and said second spectrum regions into first and second split beams comprising said first and said second components and having first and second variable intensities, respectively;

detecting means responsive to said first and said second split beams for detecting said first and said second variable intensities to produce a first electrical signal having a first variable level which is representative of said first variable intensity and a second electrical signal having a second variable level which is representative of said second variable intensity, respectively whereby the instantaneous levels of each of said electrical signals corresponds to the then instantaneous intensities of the respective components;

first calculating means responsive to said first and said second electrical signals for calculating an instantaneous difference between said first and said second variable levels to produce a different signal having a difference level which is representative of said difference;

second calculating means responsive to said difference signal for calculating a power of said difference to produce a power signal having a power level which is representative of said power;

third calculating means responsive to said first and said second electrical signals for calculating a ratio of said first variable level to said second variable level to produce a ratio signal having a ratio level which is representative of said ratio; and processing means coupled to said first through said third calculating means and operated responsive to the level of a selected one of said difference, said power, and said ratio signals to monitor the instantaneous and gradual changes in the status of said layer.

4,405,990

APPARATUS FOR DETERMINING THE RATIO OF TWO SIGNAL REPETITION RATES

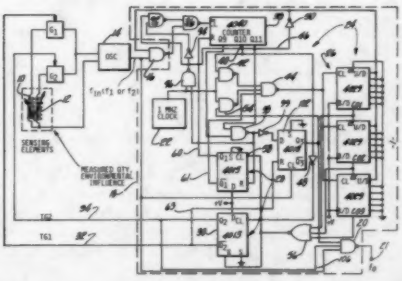
William Pickering, Cuyahoga County, Ohio, and David J. Urbanc, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00711, § 371 Date May 26, 1981, § 102(e) Date May 26, 1981, PCT Pub. No. WO82/04338, PCT Pub. Date Dec. 9, 1982

PCT Filed May 26, 1981, Ser. No. 282,999

Int. Cl.³ G06F *7/68*; G01L *19/04*

U.S. Cl. 364—703 **19 Claims**



1. Apparatus for producing an output signal (f_0) the average repetition rate of which is proportional to the ratio of two input signals having respective repetition rates f_1 and f_2 comprising:

input means (**18**) for receiving at least representative portions of the two signals f_1 and f_2;

means (**38, 70**) for generating a gating pulse which is inversely proportional in length to the repetition rate of the signal f_1;

gate means (**20, 74**) for receiving the signal f_2 and the gating pulse and outputting the signal f_2 as the output signal (f_0) for the duration of the gating pulse, said gate means (**20, 74**) being responsive to said gating pulse;

means (**102, 72**) for synchronizing the delivery of said gating pulse and the signal f_2 to said gate means; and

output means (**21**) for receiving said output signal (f_0).

4,405,991

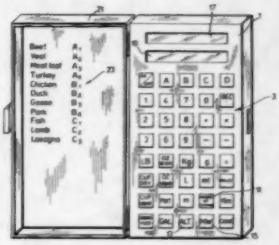
KITCHEN CALCULATOR

Robert A. Stanley, 198 Sorauren Ave., Toronto, Ontario, Canada M6R 2E9

Filed Apr. 7, 1981, Ser. No. 251,754

Int. Cl.³ G06F *15/20*; H05B *6/66*

U.S. Cl. 364—715 **10 Claims**



1. An electronic hand held calculator for automatically calculating cooking times and cooking temperatures for various quantities of different foods, said calculator having an input control system comprising a first, a second and a third group of finger operable input control members, processing means adapted to receive a first input from members in said first and second groups for designation of food type and to receive a second input from members in said second and third groups for designation of food quantity and to process said first and second inputs to provide cooking time at a cooking temperature output information for producing a desired degree of cooking and display means for receiving and displaying said first and second inputs as they are entered and for thereafter displaying such output information.

4,405,992

ARITHMETIC UNIT FOR USE IN DATA PROCESSING SYSTEMS

Jonathan S. Blau, Natick, and Josh Rosen, Westboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 23, 1981, Ser. No. 256,772

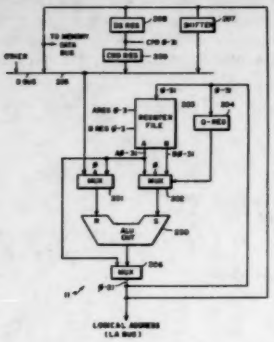
Int. Cl.³ G06F *7/52*

U.S. Cl. 364—748 **10 Claims**

1. In a data processing system having an arithmetic unit responsive to one or more instructions for performing multiplication or division operations requiring a plurality of computation cycles, each of which cycles requires the result thereof to be extended by a selected number of bits, said arithmetic unit comprising

programmable array logic means responsive to selected bits generated by said instructions and by said arithmetic unit in performing said multiplication or division operations identifying selected characteristics of the computation being performed for providing operand extension bits; and

further logic means responsive to said operand extension bits for providing said selected number of extension bits for



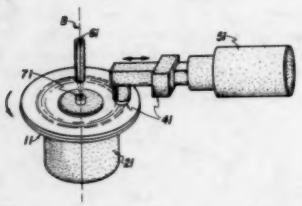
extending the computation result during the current computation cycle.

4,405,993

LIQUID CRYSTAL DISC MEMORY SYSTEM

Frederic J. Kahn; Henryk Birecki, both of Palo Alto, and Robert A. Burmeister, Jr., Saratoga, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 2, 1981, Ser. No. 221,880
Int. Cl.³ G11B *7/00, 7/24*
U.S. Cl. 365—108 **18 Claims**



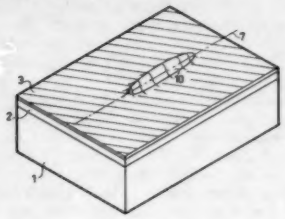
1. An information storage and retrieval device comprising:
a liquid crystal disc memory comprising:
confinement means for confining a liquid crystal medium, said confinement means configured for rotation about an axis;
a liquid crystal medium confined by said confinement means, said liquid crystal medium having localized spots therein which act as radiation scattering centers, said spots created by local heating of said liquid crystal medium and representing a desired pattern of information;
reading means for detecting radiation scattered from individual spots; and
rotating means for rotating said confinement means and said liquid crystal therein relative to said reading means, said rotation to provide high speed access to said information by said reading means.

4,405,994

THERMO-OPTIC INFORMATION WRITING PROCESS AND INFORMATION SUPPORT FOR IMPLEMENTING THIS PROCESS

Jean Cornet; Jean-Claude Lehureau, and Henriette Magna, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 21, 1981, Ser. No. 226,804
Claims priority, application France, Jan. 23, 1980, 80 01425
Int. Cl.³ G11C *13/04*
U.S. Cl. 365—126 **17 Claims**



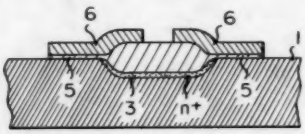
1. In a thermo-optic information writing process consisting in heating superficially in two successive writing phases by means of a focused radiation beam modulated in intensity a thermosensitive information support comprising a metal layer which covers an organic layer deposited on a substrate, the heat energy released in the metal layer by impact of the beam causes local expansion without change of state of the organic layer; this expansion creating in the metal layer stretching situated beyond the elastic limit and short of the rupture elongation of the ductile material forming said metal layer.

4,405,995

SEMICONDUCTOR MEMORY DRIVE

Kazunari Shirai, and Izumi Tanaka, both of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 24, 1981, Ser. No. 295,617
Claims priority, application Japan, Aug. 29, 1980, 55-119213
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 **10 Claims**



1. An improved semiconductor memory device formed on a substrate having a channel region, comprising:
an insulating layer formed on the channel region;
a first gate electrode, formed on the insulating layer, in an electrically floating state, at least a part of which being positioned over the channel region of the semiconductor device and being separated by the insulating layer from the channel region;
a second gate electrode, formed over the first gate electrode, comprising a control electrode, at least a part of which facing the first gate electrode and being separated by the insulating layer from the first gate electrode; and
a third gate electrode, formed over the first gate electrode, the second gate electrode and the channel region, comprising an erasing electrode, at least a part of which facing the first gate electrode and being separated by the insulating layer from the first gate electrode;
said insulating layer separating at least a part of the erasing electrode from the first gate electrode having a thickness

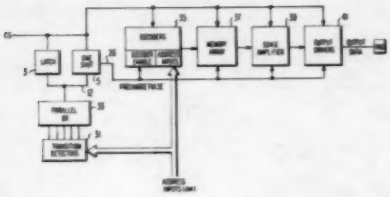
sufficient to allow passage of charges from the first gate electrode to the erasing electrode through a tunneling effect, thereby discharging the first gate electrode.

4,405,996

PRECHARGE WITH POWER CONSERVATION

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 6, 1981, Ser. No. 232,303
Int. Cl.³ G11C 7/00
U.S. Cl. 365—203 **10 Claims**



7. In a memory system in which various subsystems are precharged for proper operation and in which a precharge signal is generated when any one of certain inputs to the memory system changes state and which further includes control means for selecting or deselecting the various portions of the memory system asynchronously with respect to the occurrence of changes of said certain inputs,

the improvement comprising:

means for sensing and storing a signal manifesting the occurrence of a change of state of any one of said certain inputs when said various portions of the memory system are deselected; and

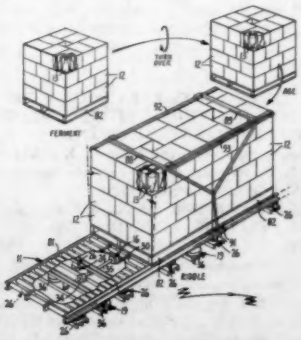
means responsive to said stored signal manifestation for subsequently producing a precharge signal when said various portions of the memory system are selected.

4,405,997

APPARATUS FOR RIDDLING BOTTLED WINES

James L. Jordan, Guerneville; James E. Huntsinger, Windsor; Dale F. Steinke, Guerneville, and David W. Williams, Bakersfield, all of Calif., assignors to F. Korbel and Bros., Guerneville, Calif.

Continuation-in-part of Ser. No. 151,129, May 19, 1980, Pat. No. 4,356,208, which is a continuation-in-part of Ser. No. 890,305, Mar. 27, 1978, Pat. No. 4,235,940. This application May 26, 1981, Ser. No. 266,833
Int. Cl.³ B01F 11/00
U.S. Cl. 366—111 **12 Claims**



1. In an apparatus for riddling wine having a frame formed for supporting a plurality of bottles of wine in an inverted neck down position and means for repeatedly tilting the frame to a first position and vibrating it while in such first position, then tilting the frame to a second position and vibrating it while such second position, a frame support comprising

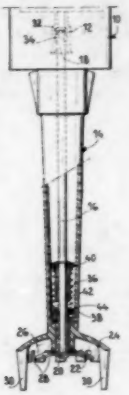
resilient support means at opposite sides of the frame formed for permitting freedom of tilting and freedom of vibration of the frame and bottles of wine carried thereon.

4,405,998

DOMESTIC MIXER

Marc P. Brison, Saint-Lo, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Oct. 12, 1982, Ser. No. 433,696
Claims priority, application France, Oct. 28, 1981, 81 20209
Int. Cl.³ B01F 7/26
U.S. Cl. 366—264 **5 Claims**



1. A domestic mixer for use in a liquid, comprising a motor unit arranged to be held by hand, a rotatable driver fixed in the motor unit, a mixing foot extending from the motor unit, and a shaft extending within said mixing foot, one end of said shaft being coupled to the said driver, a mixing screw coupled to the other end of said shaft, and a protective cover at the free end of the foot, wherein said mixing screw is movable between a safety position, in which it is located within the cover and a mixing position in which it projects beyond the cover, elastic restoring means urging said mixing screw into its safety position, said mixing screw being arranged to move against the action of the said restoring means to its mixing position when it rotates in a liquid, this displacement resulting from the screwing effect of the mixing screw in the said liquid.

4,405,999

METHOD FOR COLLECTING AND GENERATING COMPOSITE TRACE SIGNALS WITH IMPROVED SIGNAL TO NOISE RATIOS

Robert G. Zachariadis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,735
Int. Cl.³ G01V 1/36, 1/38
U.S. Cl. 367—23 **9 Claims**

1. A method of improving the signal to noise ratio of collected reflection seismic traces gathered over a water covered seafloor area having irregular geophysical statics generating irregular phase shifts in the seismic traces gathered comprising the steps of:

towing a plurality of seismic sources in a first linear array and a plurality of seismic sensors in a second linear array over the seafloor area to be surveyed;

firing during said towing step one of said seismic sources at a first source location with respect to the seafloor to generate a first seismic wave;

detecting returns of said first seismic wave with a first seismic sensor located at a first sensor location with respect to the seafloor;

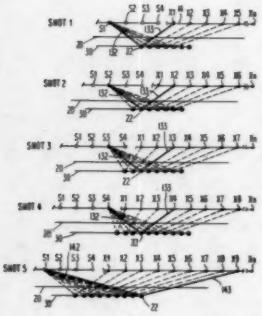
generating as a result of said detecting step a first seismic trace signal representing returns of said first seismic wave traveling to said one sensor;

firing at a later time during said towing step another of said seismic sources located at said first source location with respect to the seafloor to generate a second seismic wave;

detecting returns of said second seismic wave with a second sensor located at said first sensor location with respect to the seafloor;

generating as a result of said second detecting step a second seismic trace signal representing returns of said second seismic wave traveling to the second sensor;

repeating the firing, detecting, and generating twice with different seismic sources, each located at a second source location with respect to the seafloor during each firing step and different seismic sensors each located at a second sensor location with respect to the seafloor during each



detecting step to generate a third trace and a fourth trace having the same seismic wave propagation path between the second source location and the second sensor location, the second source location and the second sensor location each being equidistant from a midpoint location between the first seismic source location and the first seismic sensor locations whereby the four traces have the same reflection points;

stacking said first and second trace signals to produce a first composite trace having a signal to noise ratio higher than the signal to noise ratio of said first and second seismic trace signals and said third and fourth trace signals to produce a second composite trace having a signal to noise ratio higher than the signal to noise ratio of said third and fourth trace signals;

correcting said first composite trace and said second composite trace for irregular phase shifts caused by irregular geological statics between the path followed by the seismic waves generating the first composite trace and the path followed by the seismic waves generating the second composite trace; and

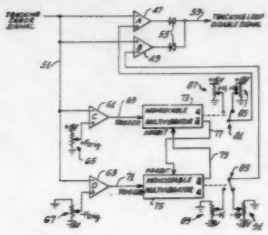
stacking together the pair of corrected composite trace signals to generate a second level composite trace signal.

4,406,000

TRACKING SYSTEM FOR OPTICAL RECORD MEDIUM

Robert M. Shoji, Gardena; John S. Chudy, and Carlyle J. Eberly, both of Long Beach, all of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Mar. 31, 1981, Ser. No. 249,549
Int. Cl.³ G11B *21/10*
U.S. Cl. 369—44 **17 Claims**



1. An improvement in a tracking apparatus for aligning a scanning reading beam in a prescribed position relative to a selected recording track on a record medium, and of the type comprising:

means for determining the location of the reading beam relative to the selected track on the record medium, and for producing a corresponding tracking error signal;

beam steering means, responsive to the tracking error signal, for controllably positioning the reading beam in the prescribed position relative to the selected track;

threshold detector means for comparing the tracking error signal to a prescribed pair of thresholds and for producing a disable signal whenever either threshold is exceeded, the disable signal indicating that a record medium defect of a prescribed type is being scanned; and

means, responsive to the disable signal, for selectively uncoupling the tracking error signal from the beam steering means, whereby the reading beam is maintained in its current position relative to the record medium whenever the reading beam scans a record medium defect of the prescribed type;

said improvement comprising:

first means for monitoring the tracking error signal to detect when the reading beam scans a first type of defect in the record medium, and for producing a corresponding first control signal;

second means for monitoring the tracking error signal to detect when the reading beam scans a second type of defect in the record medium, and for producing a corresponding second control signal; and

means for selecting the pair of thresholds from two possible pairs of thresholds based on whether the first control signal is present or the second control signal is present.

4,406,001

TIME COMPRESSION/EXPANSION WITH SYNCHRONIZED INDIVIDUAL PITCH CORRECTION OF SEPARATE COMPONENTS

Michael A. Klasco, New York, and Irwin H. Kornfeld, Brooklyn, both of N.Y., assignors to The Variable Speech Control Company ("VSC"), San Francisco, Calif.

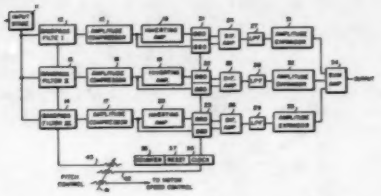
Filed Aug. 18, 1980, Ser. No. 179,180
Int. Cl.³ H04B *1/66*; G11B *31/00*
U.S. Cl. 369—88 **15 Claims**

1. In a time compression/expansion system in which the playback speed for a record is selected such that the frequencies of electric signals derived from playback of a recorded work are different than their original values and said electric signals are processed to change their frequency by periodic variable time delay the improvement comprising:

means for deriving from said record a plurality of separate electrical signal components which together represent the composite of the recorded work;

means for separately processing each of said plural signal components with period variable time delays;

means for synchronizing said periodic variable time delays for each of said components to obtain time coincidence between corresponding portions of said components after they have been delayed, and



means for combining the delayed signal components into a composite signal representation of the original work;

wherein said means for deriving said plurality of separate electrical signal components includes

means for separating the signals derived from said record into approximately contiguous frequency bands, said bands being said signal components which are separately processed with the same periodic variable time delay.

4,406,002

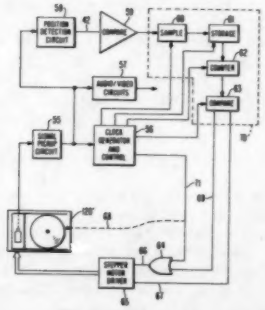
SERVO SYSTEM FOR A VIDEODISC PLAYER CARRIAGE ASSEMBLY

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1981, Ser. No. 304,349

Int. Cl.³ G11B *21/04, 17/00*

U.S. Cl. 369—220 **10 Claims**



1. A disc record player for recovering recorded signal from a rotatable disc record by means of a track following stylus housed in a carriage for translating said stylus radially across the disc record, said carriage being translated by a stepper motor coupled thereto, said player including stepper motor drive circuitry comprising:

sensor means for generating a continuous signal having a period equal to the reciprocal of the rotation rate of said disc and proportional to a relative stylus-carriage position in a direction radial to the disc record;

first means for reducing said position signal to a bilevel signal, having first and second amplitudes depending on the position signal being greater or lesser than a substantially constant reference signal respectively; and

second means responsive to said bilevel signal for determining the relative duration of the first to second level amplitudes for substantially 360 degrees of signal track and generating respective stepper motor control signals for the duration of the first level amplitude being a prescribed amount greater or lesser than the duration of the second level amplitude.

4,406,003

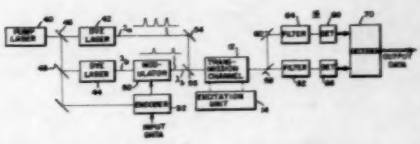
OPTICAL TRANSMISSION SYSTEM

Joseph H. Eberly; Peter D. Drummond, both of Rochester, N.Y., and Marek J. Konopnicki, Albuquerque, N. Mex., assignors to The University of Rochester, Rochester, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,868

Int. Cl.³ H04B *9/00*

U.S. Cl. 370—3 **31 Claims**



1. The method for simultaneous propagation of a plurality of electromagnetic pulses of different wavelengths which comprises the step of applying said pulses in at least partially overlapping relationship in time to a channel containing a medium having a multiplicity of energy levels, and matching the wavelength of said pulses and the transitions between successive pairs of said levels so that different ones of said pulses are in resonant and energy interactional relationship with different ones of said transitions.

4,406,004

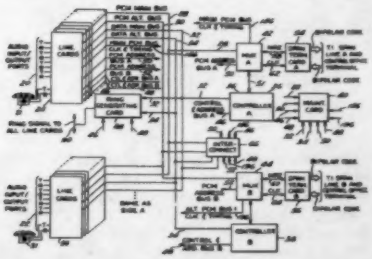
RING SCHEDULING APPARATUS FOR A DIGITAL MULTIPLEXED TELECOMMUNICATION SYSTEM

Jay D. Hall, Westminster; Theodore M. Stump, Costa Mesa, and Charles W. Thode, Tustin, all of Calif., assignors to Anaconda-Ericsson, Inc., Greenwich, Conn.

Filed Nov. 5, 1980, Ser. No. 204,298

Int. Cl.³ H04J *3/12;* H04M *3/02;* H04Q *5/08*

U.S. Cl. 370—15 **34 Claims**



1. A telephone system ring signal scheduler, comprising:

clock means for establishing successive clock periods;

first and second telephone lines, each said line for coupling to a plurality of telephones, each said telephone responsive to a ring signal having a different characteristic;

ring signal generator means responsive to said clock means for producing a ring signal having a first characteristic during a first one of said successive clock periods, and a different second characteristic during a second one of said successive clock periods; and

a controller means for sorting telephones being called into ring signal compatible groups of less than or equal to a predetermined maximum number of lines coupled to tele-

phones responsive to a ring signal of common characteristics and for causing said ring signal generator means to generate and apply a ring signal having said common characteristics to each said group, each said group receiving its particular common ring signal during a particular clock period selected by said controller means.

21. An apparatus for generating a ring signal in a digital multiplexed telecommunication system including:

a transformer having a primary winding and a secondary winding, said transformer having a ring signal output and a D.C. input coupled to its secondary winding;

an amplifier having its output coupled to and driving the primary winding of said transformer;

a signal generator having a control word input for receiving digital data indicating the frequency of periodic waveform to be generated and having an output coupled to the input of said amplifier;

a latch means for storing control word data having a data output coupled to the control word input of the signal generator and having a polarity data output and having a data input for receiving digital data indicating frequency and polarity and an address and control input for receiving signals indicating when data is to be loaded from said data input into the latch; and

a means coupled to the polarity data output of said latch means and to the D.C. input of the secondary winding for controlling whether a positive or negative DC voltage is applied to the DC input.

4,406,005

DUAL RAIL TIME CONTROL UNIT FOR A T-S-T-DIGITAL SWITCHING SYSTEM

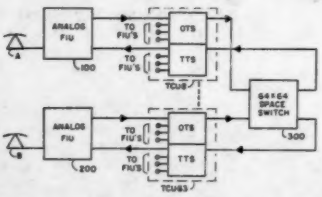
Nathaniel Simmons; Stig Magnusson, both of Phoenix; Sergio E. Puccini, Scottsdale, all of Ariz.; Donald W. McLaughlin, Naperville, and David J. Stelt, Lombard, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 23, 1980, Ser. No. 219,547

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—63 **7 Claims**



1. In a time-space-time switching system including first and a second buses, each bus transmitting a plurality of PCM voice samples to a switching network, said buses being connected between said network and subscriber interface equipment, said switching network comprising:

first and second space switching means;

first and second terminating time switching means connected respectively to said first and second space switching means and connected to said subscriber interface equipment, each of said terminating time switching means being operated to switch said PCM voice samples to said subscriber interface equipment;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM voice samples from said subscriber interface equipment, connected respectively between said first and said second buses and said first and second space switching means and said subscriber interface equipment;

each of said originating time switching means including:

first and second memory means each connected to said first and second buses, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously in sequential time slots with said PCM samples transmitted via said buses; and

said first and said second memory means further being operated so that said PCM samples contained on said first bus may be switched through said second space switching means to said second terminating time switching means and said PCM samples contained on said second bus may be switched through said first space switching means to said first terminating time switching means.

4,406,006

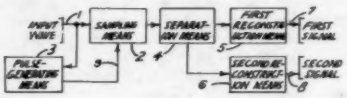
DUAL-SIGNAL A-M RECEIVING APPARATUS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada H3R 1K3

Filed Jun. 18, 1982, Ser. No. 389,914

Int. Cl.³ H04J *15/00*; **H04H** *5/00*

U.S. Cl. 370—119 **7 Claims**



1. Receiving apparatus for an input wave, comprising a first carrier, transmitted or partly suppressed, double-sideband amplitude modulated by a first signal with a first highest frequency, and a second carrier, with the same frequency as, and spaced in phase angle from, said first carrier, double-sideband amplitude modulated by a second signal with a second highest frequency, and superimposed noise in the frequency band of said first and said second modulated carriers; which comprises:

pulse-generating means, which receives said input wave and which generates a sequence of short gating pulses occurring alternately substantially at zero-crossings of said second carrier, at a frequency greater than twice the highest frequency of said first and said second signals, and at zero-crossings of said first carrier, at the same frequency, and

sampling means, consisting of a gate which receives and samples said input wave at instants of gating pulses received from said pulse-generating means, and

separation means, which receives the output of said sampling means and separates the components of said input wave, and

first reconstruction means, which receives a first output of said separation means, and reconstructs and delivers said first signal, substantially free from said second signal, and

second reconstruction means, which receives a second output of said separation means, and reconstructs and delivers said second signal, substantially free from said first signal.

4,406,007

CIRCUIT ARRANGEMENT FOR TIME DIVISION MULTIPLEX DATA TRANSMISSION WITH A BUS SYSTEM

Horst Kister, Wehrheim, and Horst Ullrich, Schöneck, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany

Division of Ser. No. 35,003, May 1, 1979. This application Oct. 22, 1981, Ser. No. 313,917

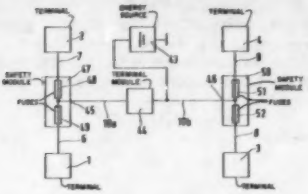
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823708; Jul. 7, 1978, 2829839

Int. Cl.³ H04J *3/14*

U.S. Cl. 370—85 **2 Claims**

1. An arrangement for time division multiplex data transmission through a bus system which includes a bus line and a

plurality of terminals connected to the bus line in a predetermined succession and in a predetermined combination, in which each terminal establishes a data transmitting connection to the bus line and means connected in the bus system for detecting short circuits and shutting down individual sections



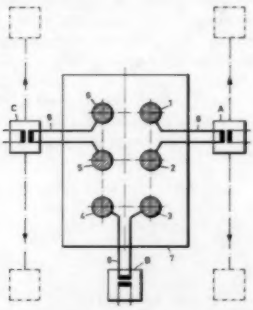
of the bus line to protect the individual sections without shutting down all sections, including safety devices respectively connecting the terminals to the individual sections of the bus line, and an energy source connected to the bus line at point of common connection to said safety devices.

4,406,008

THREE PHASE ARC MELTING AND REDUCTION FURNACE

Heribert König, Duisburg, and Heinz Stark, Essen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,946
Int. Cl.³ H05B *7/144, 7/18*
U.S. Cl. 373—102 **5 Claims**



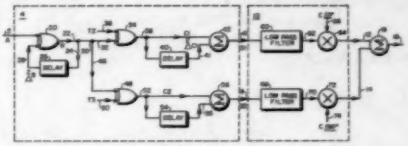
1. A three phase arc metallurgical furnace, comprising:
(a) a stationarily maintained elongated furnace vessel having a substantially rectangular floor plan and a longitudinal axis;
(b) at least six electrodes providing electrical energy, said electrodes being arranged symmetrically in at least two rows and equidistantly about said longitudinal axis of said furnace vessel;
(c) said electrodes being divided into pairs of adjacent electrodes, each such pair being electrically connected in series as a single phase circuit, each of said circuits being electrically independent of the remaining circuits;
(d) a transformer for each of said pair of electrodes to form bifilar conductor leads, said transformers being connected to said electrode pairs by high voltage conduits;
(e) said electrodes being arranged such that each two adjacent electrodes and two opposite electrodes to said adjacent electrodes are located in the corners of an imaginary square;
(f) the distance of the electrodes from the walls of said furnace and the mutual distance of the electrodes from each other are determined so that the individual process-technically active bath surfaces extending about the electrodes form a substantially continuous surface covering a maximum horizontal cross section of said vessel;
(g) said high voltage conduits being positioned symmetrically about said longitudinal axis of said vessel and;
(h) the current flow in said high voltage conduits to one of said electrodes of each pair of electrodes is opposite in direction to the current flow in said high voltage conduit to the other of said electrodes in each pair to thereby reduce the circuit's inductive reactance.

4,406,009

METHOD AND APPARATUS FOR CONVERTING BINARY INFORMATION INTO A SINGLE-SIDEBAND 3-LEVEL CORRELATIVE SIGNAL

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Apr. 30, 1979, Ser. No. 34,320
Int. Cl.³ H04L *25/34, 27/02*
U.S. Cl. 375—18 **28 Claims**



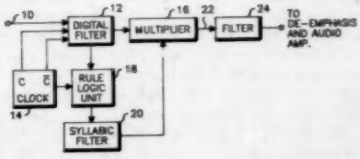
1. Apparatus for generating a single-sideband signal from a serial bit stream, which comprises:
binary means for processing said serial bit stream to obtain in-phase and quadrature-phase 2-level correlative signals;
means for digitally converting said in-phase and said quadrature-phase 2-level correlative signals, respectively, into in-phase and quadrature-phase 3-level correlative signals;
a line-frequency oscillator arranged to provide in-phase and quadrature-phase line carrier frequency components;
means for separately analog modulating the in-phase and quadrature-phase line carrier frequency components, respectively, with the in-phase and quadrature-phase 3-level signals; and
means for summing the modulation products obtained from the in-phase and quadrature-phase analog modulation processes, whereby the single-sideband signal is obtained.

4,406,010

RECEIVER FOR CVSD MODULATION WITH INTEGRAL FILTERING

David L. Weiss, Roselle; Eric F. Ziolko, Schaumburg, both of Ill., and Tim A. Williams, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1980, Ser. No. 221,189
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—32 **4 Claims**



1. A CVSD receiver for producing an analog output from a CVSD bit stream comprising:
(a) a digital filter receiving a bit stream containing CVSD modulation and filtering the bit stream to produce a filtered output;

(b) a rule logic circuit connected to the digital filter and responsive to the bit stream to generate a signal on the occurence of a predetermined number of consecutive bits of the same polarity;

(c) a syllabic filter connected to the rule logic circuit to produce a voltage that varies in response to the output of the rule circuit; and

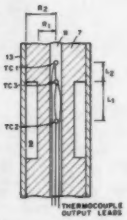
(d) means for multiplying the voltage produced by the syllabic filter by the filtered output of the digital filter to produce the analog output.

4,406,011

GAMMA THERMOMETER BASED REACTOR CORE LIQUID LEVEL DETECTOR

Thomas J. Burns, Knoxville, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 16, 1981, Ser. No. 274,121
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—247 **4 Claims**



1. A nuclear reactor core liquid-level detector comprising:

at least one elongated gamma heated member disposed within said reactor core and submerged in reactor core coolant during normal operation, said gamma heated member including a central bore, at least one axially extending thermal sensing region having a first portion formed by a circumferential thermal resistance zone to inhibit radial heat flow in said first portion of said thermal sensing region thereby forming a hot zone in said sensing region and a second portion axially adjacent said first portion having no means to inhibit radial heat flow thereby forming a relatively cold zone in said sensing region, and a mid zone at a transition between said first portion and said second potion and a dual differential thermocouple assembly disposed in said central bore at said sensing region having a first thermocouple junction located at said cold zone, and a second thermocouple junction located at said hot zone, and a third thermocouple junction located at said mid zone, each of said first, second and third thermocouple junctions being connected electrically in series to provide a first voltage signal (ΔV_3) between said first and third thermocouple junctions which is proportional to the difference in temperature between said hot zone and said mid zone ($T_{hot}-T_{mid}$) and a second voltage signal (ΔV_2) between said second and third thermocouple junctions which is proportional to the difference in temperature between said mid zone and said cold zone ($T_{mid}-T_{cold}$); and

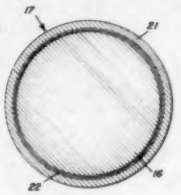
a signal processing means responsive to said first and second voltage signals for generating an output signal proportional to the ratio of said first voltage signal to said second voltage signal ($\Delta V_3/\Delta V_2$) which is indicative of the presence or absence of core coolant at said sensing region.

4,406,012

NUCLEAR FUEL ELEMENTS HAVING A COMPOSITE CLADDING

Gerald M. Gordon; Robert L. Cowan, II, both of Fremont, and John H. Davies, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 95,161, Nov. 19, 1979, abandoned, which is a continuation of Ser. No. 725,824, Sep. 23, 1976, abandoned, which is a continuation of Ser. No. 522,769, Nov. 11, 1974, abandoned. This application Jan. 26, 1981, Ser. No. 228,344
Int. Cl.³ G21C *3/20*
U.S. Cl. 376—414 **6 Claims**



1. A nuclear fission fuel element comprising a composite cladding container for fissionable fuel having an inside surface rendered resistant to stress corrosion cracking and attack attributable to nuclear fission and the effects thereof, said fuel element consisting essentially of a cladding container for fissionable fuel of at least one zirconium metal selected from the group consisting of zirconium and zirconium alloys and having bonded on the inside surface thereof a protective shielding layer of copper metal of less than about one weight percent impurities providing a barrier over the inside surface of the zirconium metal shielding said inside surface from the deleterious action of fission products, said protective shielding layer being of a thickness of about 0.0001 to about 0.002 inches, said cladding container having enclosed therein a body of fissionable fuel forming a central core with a gap between said container and body of fissionable fuel.

4,406,013

MULTIPLE BIT OUTPUT DYNAMIC RANDOM-ACCESS MEMORY

Edmund A. Reese, Portland; Dieter W. Spaderna, and Stephen T. Flannagan, both of Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 1, 1980, Ser. No. 192,740
Int. Cl.³ G06F *11/00*; G06M *3/00*
U.S. Cl. 377—29 **4 Claims**

1. In a dynamic random-access memory which includes memory cells coupled to sense amplifiers by bit lines, and a digital counter for selecting cells for refreshing, an improvement in said memory for checking the operation of said counter comprising:

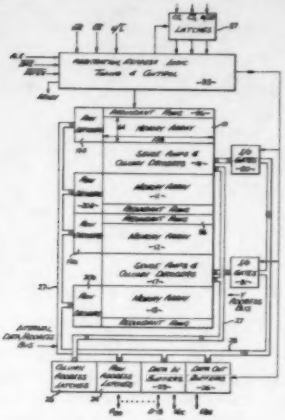
writing means for writing one binary state into said cells, said writing means coupled to said cells;

charging means for charging said bit lines, said charging means coupled to said bit lines;

selection means coupled to said counter for selecting said cells in response to signals from said counter;

disabling means coupled to said sense amplifiers, for preventing sensing by said amplifiers, such that as said cells are selected by said selection means, charge from said bit lines causes said cells to be charged to the other binary state; and,

reading means coupled to said cells for reading the contents of said cells;



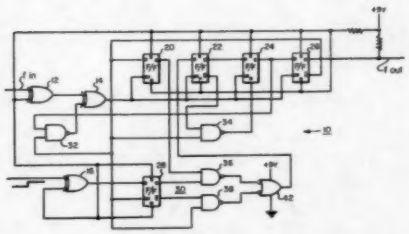
whereby if said counter is operating properly said cells will all be charged to said other binary state.

4,406,014

SWITCHED FREQUENCY DIVIDER

Joseph Doron, West Hartford, Conn., assignor to Bristol Babcock Inc., Waterbury, Conn.

Filed Apr. 3, 1981, Ser. No. 250,860
Int. Cl.³ H03K *21/36*
U.S. Cl. 377—107 **7 Claims**



1. Apparatus for dividing the frequency of a signal comprising:

an array of clocked bistable devices which are linked together so as to propagate through the array a cycle of a high signal and a low signal applied to an input to the array, said array producing at an output from the array an output signal which goes through a cycle of a high signal and a low signal at a first frequency which is less than that of a clock signal applied to said bistable devices;

first gating means for inserting at least one more clocked bistable device into the array in response to a control signal applied to said apparatus, whereby the frequency of the output signal is changed to a second frequency,

second gating means for making such an insertion only when the output signal from the array completes one of said cycles, and

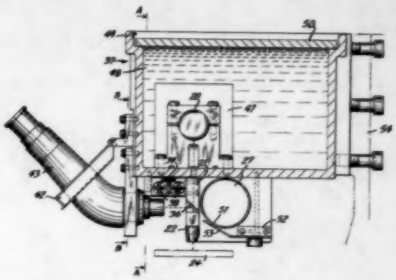
means for imparting a duty cycle of approximately 50 percent to said output signal at both said first frequency and said second frequency.

4,406,015

FLUORESCENT X-RAY FILM THICKNESS GAUGE

Toshiyuki Koga, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,518
Claims priority, application Japan, Sep. 22, 1980, 55-135058
Int. Cl.³ G01N *23/20*; G21K *1/00*
U.S. Cl. 378—050 **5 Claims**



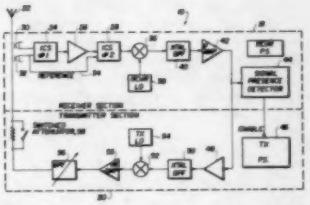
1. A fluorescent X-ray film thickness gauge comprising: an X-ray tube for irradiating an X-ray; a detector for detecting a fluorescent X-ray from a sample to which an X-ray is irradiated from the X-ray tube; a collimator for guiding the X-ray to the sample; a shutter interposed between the collimator and the X-ray tube slidably in the horizontal direction; a mirror positionable on a passing axis of the X-ray; and a viewing means for viewing a point to irradiate the X-ray on the sample; wherein an optical axis of the viewing means corresponds with the passing axis of the X-ray.

4,406,016

VHF SENSOR IN-BAND RADIO RELAY

Burton S. Abrams, and Andrew E. Zeger, both of Wyndmoor, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 27, 1981, Ser. No. 325,162
Int. Cl.³ H04B *7/14*
U.S. Cl. 455—19 **16 Claims**



1. Radio apparatus for operating as a signal repeater for the relaying of information signals from one location to another over a network, comprising:

co-located receiver and transmitter means coupled to a common antenna and being operable such that RF signals received by said receiver means are retransmitted without substantial delay from said transmitter means and wherein said receiver means includes RF input amplifier means, and further includes a first adaptive interference signal cancellation means coupled between said common antenna and said RF input amplifier means for preventing RF signals being currently retransmitted from rendering said receiver means unresponsive to concurrently received RF signals, and further including a second adaptive interference signal cancellation means coupled to the

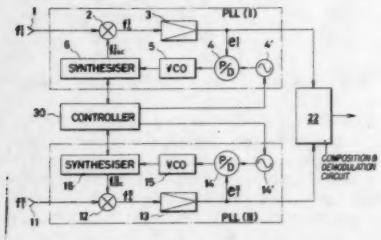
output of said RF input amplifier means to cancel any residue of interference signals not cancelled by said first adaptive interference signal cancellation means, whereby said receiver and transmitter means may be simultaneously operated without signal interference between one another thereby permitting near continuous use of both said receiver and transmitter means at a substantially 100% duty cycle.

4,406,017

METHOD FOR DIVERSITY RECEPTION AND APPARATUS THEREFOR

Kozo Takahashi, Higashi-Kurume, Japan, assignor to Radio Research Laboratories Ministry of Posts & Telecommunications, Koganei, Japan

Filed Mar. 17, 1980, Ser. No. 130,717
Claims priority, application Japan, Jun. 2, 1979, 54-68219
Int. Cl.³ H04B *7/08*
U.S. Cl. 455—137 **14 Claims**



1. A method of diversity reception, comprising the steps of transmitting one type of information signals in the form of one or more coherently interrelated signals, receiving the transmitted information signals in two or more receiving systems and locking the phases of the received information signals in phase-lock loops of the respective receiving systems by means of local oscillation frequencies produced in the phase-lock loops, thereby stabilizing the reception of said information signals, which method of diversity reception is characterized by causing the local oscillation frequency of the phase-lock loop of one of the receiving systems still locking the phase of said received information signals to be applied to the phase-lock loop of one of said receiving systems which has accidentally lost the phase-lock of the received signals, by utilizing the coherence of the separately received signals, thereby to resume the phase-lock of the received signals in said one of said receiving systems which has lost the phase lock.

4,406,018

AUTOMATIC FM TUNER

Minoru Motohashi, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,181
Int. Cl.³ H03J *7/24, 7/28;* **H04B** *1/26*
U.S. Cl. 455—164 **1 Claim**

1. An automatic FM tuner in which a broadcasting station frequency is searched by varying an output frequency of a voltage controlled oscillator in response to a voltage synthesizer having clock pulses coupled thereto, comprising:

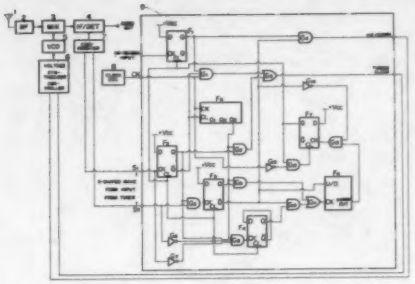
an FM detector having an S-shaped detection characteristic defining a normal tuning point within a receiving range,

a comparator connected to an output of said FM detector to sense the presence of a broadcasting station frequency within said receiving range,

means responsive to said clock pulses to decrease the frequency thereof for providing decreased frequency clock pulses,

means for counting a first number of said decreased frequency clock pulses in a predetermined direction while said broadcasting station frequency is present within said receiving range, and

means for terminating the feeding of clock pulses to said synthesizer when said counting means counts a second



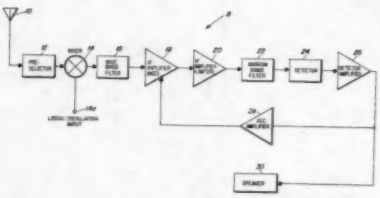
number of decreased frequency clock pulses equal to one-half of said first number of pulses while said comparator senses the broadcasting station frequency within said receiving range, and thereby terminating the variation of the output frequency of said voltage controlled oscillator.

4,406,019

SELECTIVITY MEANS IN AMPLITUDE MODULATED RADIO RECEIVERS

John D. Ide, Margate; David J. Settlemire, Pompano Beach, and Mario C. Novo, Miami, all of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 16, 1981, Ser. No. 322,107
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—245 **3 Claims**



1. In a superheterodyne type receiver for amplitude modulated radio signals, said receiver including mixer and tunable local oscillator stages for converting to intermediate frequency signals appearing on a selected frequency channel from amongst a plurality of frequency channels within the receiver operating band, said receiver further including a variable gain intermediate frequency amplifier for amplifying said converted signals, a detector for said amplified intermediate frequency signals and an automatic gain control amplifier for controlling the gain of said intermediate frequency amplifier;

improved means for preventing detection of signals by said receiver whenever the frequency of such signals is within a frequency channel adjacent to the selected frequency channel of said receiver, comprising,

a relatively wide band filter to which frequency converted signals from said mixer stage are applied and from which signals are applied as inputs to said intermediate frequency amplifier, said wide band filter having an attenuation v. frequency characteristic which is substantially flat from a first frequency below the lowest intermediate frequency of said receiver to a second frequency above the highest intermediate frequency of said receiver and having a

lower skirt sloping from said first frequency toward frequencies lower than said first frequency to define increasing attenuation with decreasing frequency and having an upper skirt sloping from said second frequency toward frequencies higher than said second frequency to define increasing attenuation with increasing frequency;

a relatively narrow band filter to which signals amplified by said intermediate frequency are applied and from which signals are applied as inputs to said detector, said narrow band filter having an attenuation v. frequency characteristic which is substantially flat from the lowest intermediate frequency of said receiver to the highest intermediate frequency of said receiver and having a lower skirt sloping from said lower intermediate frequency toward frequencies lower than said lowest intermediate frequency to define increasing attenuation with decreasing frequency and having an upper skirt sloping from said highest intermediate frequency toward higher frequencies to define increasing attenuation with increasing frequency;

means for applying the output of said detector to said automatic gain control amplifier for controlling the gain of said intermediate frequency amplifier, said automatic gain control amplifier being adjusted to increase the gain of said intermediate frequency amplifier to saturation whenever an interfering signal is present at the input to said wide band filter, said interfering signal having a frequency such that said wide band filter affords less attenuation at such frequency than he attenuation afforded by said narrow band filter at such frequency.

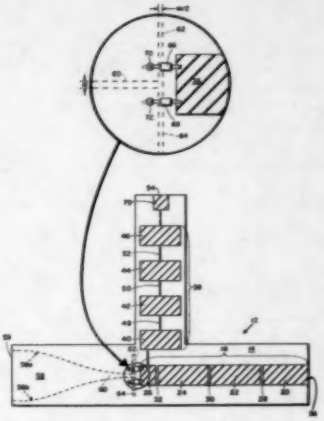
4,406,020

MILLIMETER WAVE PRINTED CIRCUIT MIXER

John Reindel, San Diego, Calif., assignor to The United States of America represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 288,229
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—327 **11 Claims**

10. In a millimeter wave balanced mixer having a printed circuit card situated within a waveguide housing, and having a waveguide to slotline transition on said circuit card for receiving an RF signal, a section of slotline on said circuit card coupled to said slotline transition for propagating said RF signal, a microstrip filter on said printed circuit card for receiving an LO signal, an IF output port on said circuit card, first and second mixer diodes connected to said circuit card adjacent said section of slotline said diodes further operably coupled to said microstrip filter for providing an IF signal to said



IF output port in response to said RF and LO signals, the improvement comprising:

first and second slotline stubs extending from said section of slotline, each respective slotline stub being shorted at respective ends thereof; and

said first mixer diode extending over said first slotline stub and said second mixer diode extending over said second slotline stub.

DESIGN PATENTS

GRANTED SEP. 20, 1983

ERRATA

For CLASS	See PATENT NO.
D09–317	270,614

270,584

OVERALL SIDE PANELS

Joyce E. Ogden, P.O. Box 92, Austin, Colo. 81410

Filed May 4, 1981, Ser. No. 260,041

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—29

270,585

HUNTING VEST

Matti Viio, Box 563, S-191 05 Sollentuna, Sweden

Filed Jan. 5, 1981, Ser. No. 222,915

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—184

270,586

EMERGENCY PACK

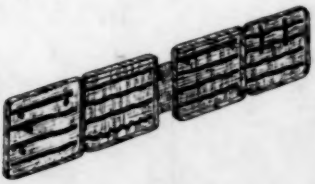
William A. Tatnall, Auburn, and Malcolm L. Frost, Buena Park, both of Calif., assignors to Rescue Services, Inc., Auburn, Calif.

Filed Apr. 20, 1981, Ser. No. 255,690

Term of patent 14 years

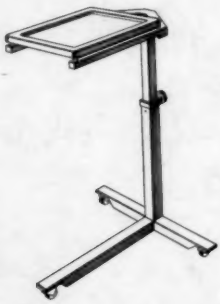
Int. Cl. D3—*01*

U.S. Cl. D3—32



270,587
CHILD'S ROCKING HORSE
Timothy A. O'Connell, 12625 W. Atlantic Pl., Lakewood, Colo. 80228
Filed Jul. 6, 1981, Ser. No. 280,374
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—11

270,588
SURGICAL INSTRUMENT TABLE
Samuel B. Kemple, Independence, Mo., assignor to LJM Enterprises, Inc., Prairie Village, Kans.
Filed Jul. 20, 1981, Ser. No. 285,158
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27



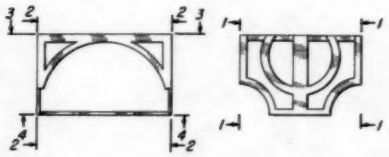
270,589
CHAIR
Frank E. Bird, Jr., P.O. Box 345, Loganville, Ga. 30249
Filed Mar. 16, 1981, Ser. No. 243,721
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

270,590
STEPSTOOL
France Berlic, Rozna dolina c.III/5, Ljubljana, Yugoslavia 61000
Filed Jun. 9, 1981, Ser. No. 271,985
Claims priority, application Yugoslavia, Apr. 7, 1981, M-122/81
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—32

270,591
TABLE
Walter F. Harper, Jr., and Thomas W. Winecoff, both of P.O. Box 147, Eagle Springs, N.C. 27242
Filed Jul. 6, 1981, Ser. No. 280,464
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

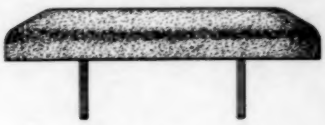
270,592
ADJUSTABLE TABLE
Virginia DuBrucq, 336 S. Washington, Denver, Colo. 80209
Filed Feb. 27, 1981, Ser. No. 238,947
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

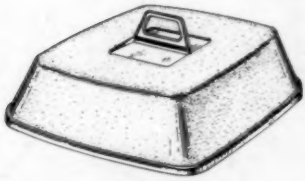
270,593
COFFEE TABLE
Bruce N. Lee, 19 Columbia Ave., Trenton, N.J. 08618
Filed Jun. 22, 1981, Ser. No. 276,314
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



270,594
CHAIR FRAME
Mike T. Claman, New York, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Mar. 27, 1981, Ser. No. 248,332
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

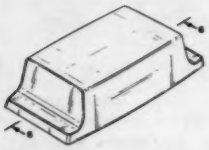
270,595
SEAT FOR USE WITH A BENCH
Victor H. Yates, Shelley, England, assignor to Sutcliffe Engineering Holdings Limited, West Yorkshire, England
Filed Mar. 2, 1981, Ser. No. 239,381
Claims priority, application United Kingdom, Sep. 11, 1980, 996529
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

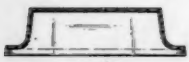




270,596
DISH COVER LID
Abigail H. Gallagher, and Robert P. Trudeau, both of Chicago, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Apr. 20, 1981, Ser. No. 255,973
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—40

270,597
BUTTER DISH COVER OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries, Inc., Northbrook, Ill.
Filed Jun. 18, 1981, Ser. No. 274,949
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—40



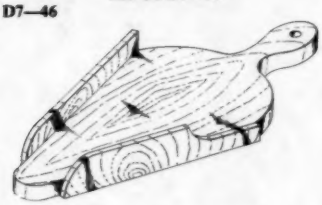


270,598
FOOD MOLD
David W. Miller, Salem, Mass., assignor to Benjamin & Medwin, Inc., New York, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,860
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—43

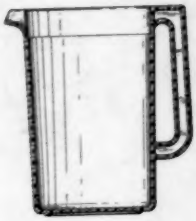
270,599
COOKIE CUTTER
Arthur P. Gershman, 1300 Belleview Blvd., Alexandria, Va. 22307
Filed Dec. 18, 1981, Ser. No. 331,905
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—43

270,600
FOOD MOLD
David W. Miller, Salem, Mass., assignor to Benjamin & Medwin, Inc., New York, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,859
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—44

270,601
CUTTING BOARD
Edwin A. Price, 16001 E. 11th Ave., Denver, Colo. 80211
Filed Apr. 13, 1981, Ser. No. 253,788
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46

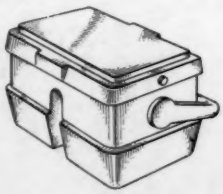


270,602
PITCHER OR THE LIKE
Ann K. Fritz, Auburndale, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Continuation-in-part of Ser. No. 60,554, Jul. 25, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 272,834
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—319

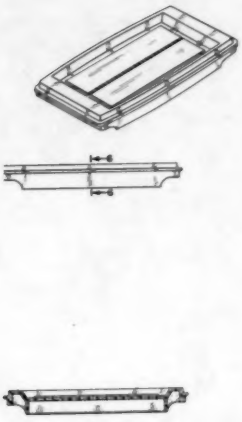


270,603
WINE BUCKET
Sheamus J. McGlade, 88 Winter St., City Island, N.Y. 10464
Filed Jul. 24, 1981, Ser. No. 286,707
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—70

270,604
PORTABLE COOLER
Donald A. Zauft, 390 San Miguel, San Luis Obispo, Calif. 93401
Filed May 11, 1981, Ser. No. 262,341
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D7—77

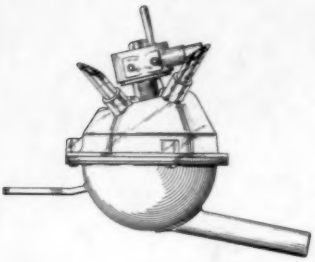


270,605
BUTTER TRAY OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 18, 1981, Ser. No. 274,948
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84

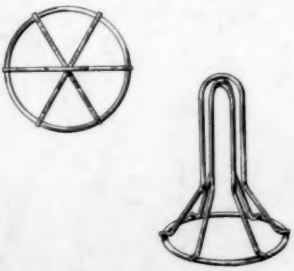


270,606
BARBEQUE GRILL
David N. McCrary, P.O. Box 734, Valdosta, Ga. 31601, and Robert O. Binford, 1002 Elizabeth St., Seguin, Tex. 78155
Filed Feb. 12, 1982, Ser. No. 348,432
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—334

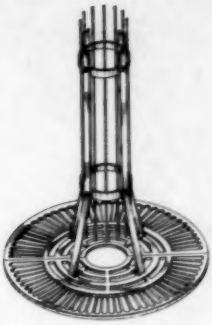
270,607
MILKER
Harold V. Swanson, Downers Grove, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.
Filed Mar. 5, 1981, Ser. No. 240,997
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D7—368



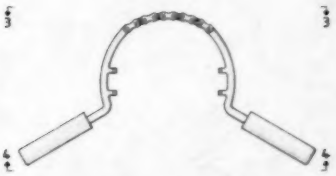
270,608
GAME HEN ROASTING RACK
George Spanek, and Denis C. Spanek, both of 855 San Mateo Dr., San Mateo, Calif. 94401
Filed Apr. 27, 1981, Ser. No. 257,964
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—409



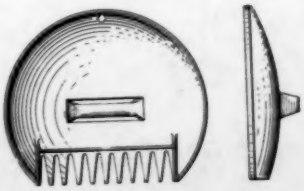
270,609
TREE GUARD
Robert E. Haggard, Everett, Wash., assignor to Merry Haggard, Snohomish, Wash.
Division of Ser. No. 158,937, Jun. 12, 1980. This application Sep. 13, 1982, Ser. No. 417,030
Term of patent 14 years
Int. Cl. D8—*99*; D31—*00*
U.S. Cl. D8—01



270,610
TRUNK GRIPPING CLAMP FOR TREE CLIMBING
Olis R. Kinard, Jr., Rte. 3, Box 156, Dora, Ala. 35062
Filed May 26, 1981, Ser. No. 266,915
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—4

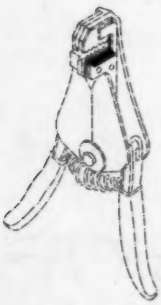


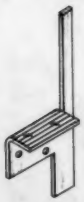
270,611
HAND SCOOP FOR GRASS AND LEAVES
Mathias M. Check, 34 Bowman Dr., Greenwich, Conn. 06830, and Elia L. Goodby, 22 Barrow Dr., East Greenwich, R.I. 02818
Filed Sep. 8, 1981, Ser. No. 299,732
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—9



270,612
COMBINED SHOVEL AND LIFT ATTACHMENT
John W. Storlie, Box 56, Santiago, Minn. 55377
Filed Feb. 27, 1981, Ser. No. 239,023
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

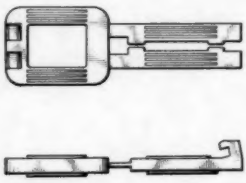
270,613
WIRE STRIPPING MEASURING GUIDE
Paul W. Morgan, Utica, N.Y., assignor to Partlow Corporation, New Hartford, N.Y.
Filed Jan. 15, 1981, Ser. No. 225,352
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—58



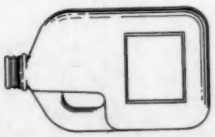


270,614
BOTTLE
Joel Desgrippes, Paris, France, assignor to L'Oreal, Paris, France
Filed Nov. 26, 1980, Ser. No. 210,784
Claims priority, application France, Jun. 2, 1980, 801742
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—317

270,615
BUCKLE FOR STRAPPING PARCEL OR THE LIKE
Bruce W. Stuart, 1911 Heliotrope Dr., Santa Ana, Calif. 92710
Filed Apr. 6, 1981, Ser. No. 251,508
Term of patent 14 years
Int. Cl. D08—*08*
U.S. Cl. D8—383



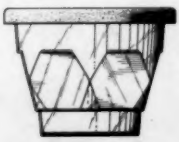
270,616
JUG
John A. Cox, Bethel Park, Pa., assignor to Liqui-Box Corporation, Worthington, Ohio
Filed Aug. 5, 1980, Ser. No. 173,381
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378



270,617
PACKAGING CONTAINER
Roman L. Skowronski, and John M. Szekeres, both of Cuyahoga County, Ohio, assignors to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 12, 1981, Ser. No. 224,615
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

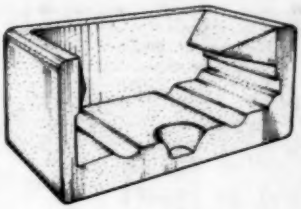
270,618
PACKAGING CONTAINER
Irving Shillman, Brooklyn, N.Y., assignor to M. & S. Shillman, Inc., Brooklyn, N.Y.
Filed Mar. 20, 1981, Ser. No. 246,052
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

270,619
COMBINED CONTAINER AND LID
Raymond Zimmer, 14, rue du Chateau, Horbourg-Wihr, 68000 Colmar, France
Filed May 21, 1981, Ser. No. 266,126
Claims priority, application France, Dec. 18, 1980, 803903
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424

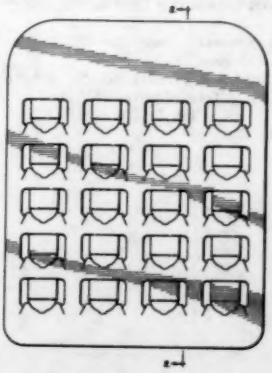


270,620
POURING ATTACHMENT FOR CONTAINERS OR THE LIKE
Phillip J. Owens, Louisville, Ky., assignor to The West Company, Phoenixville, Pa.
Filed Apr. 3, 1981, Ser. No. 250,648
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—447

270,621
PACKAGING FORM
Ennio Sala, Milan, Italy, assignor to Polistil S.p.A., Milan, Italy
Filed May 4, 1981, Ser. No. 260,433
Claims priority, application Italy, Nov. 4, 1980, 2327180[U]
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—456

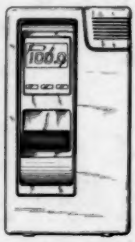


270,622
ARTICLE DISPLAY CARD
Gregory J. Hardy, 152 South Ave., Newark, N.Y. 14523
Filed May 21, 1981, Ser. No. 265,846
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—457

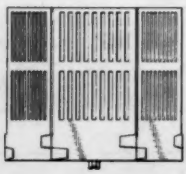


270,623
COMBINED LCD-CLOCK AND HOLDER FOR A BALL POINT PEN
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed May 22, 1981, Ser. No. 266,476
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, MR134
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2

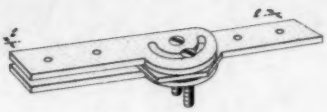
270,624
DIGITAL FEVER THERMOMETER
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Aug. 24, 1981, Ser. No. 295,342
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



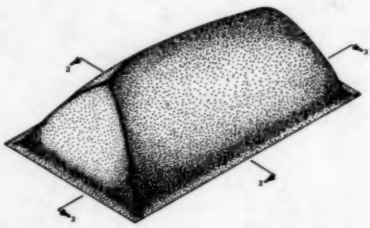
270,625
UNIPOLAR CHAMBER FOR IONIZATION SMOKE DETECTOR
Richard E. Hiltenbrand, Naperville, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Aug. 24, 1981, Ser. No. 295,676
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



270,626
VEHICLE TOWING HITCH
Jean P. Caron, Rte. 1, Pain Ct., Ontario, Canada NOP 1ZO
Filed Nov. 21, 1980, Ser. No. 209,125
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

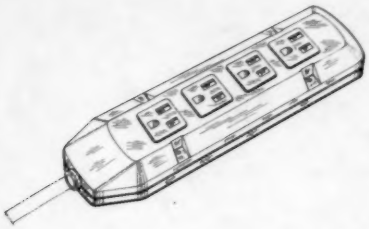


270,627
WIND DEFLECTOR FOR TRUCK TRAILERS OR THE LIKE
David R. Williams, 1822 Huntsville Rd., Birmingham, Ala. 35234
Filed Nov. 6, 1980, Ser. No. 204,463
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



270,628
RIGHT ANGLED PLUG FOR ELECTRIC CORD
Bert Bobrovniczky, Don Mills, Canada, assignor to Noma Canada Ltd., Scarborough, Canada
Filed Mar. 25, 1981, Ser. No. 247,479
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28

270,629
MULTIPLE OUTLET STRIP
Douglas Drew, Toronto, Canada, assignor to Noma Canada Ltd., Scarborough, Canada
Filed Apr. 13, 1981, Ser. No. 253,996
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

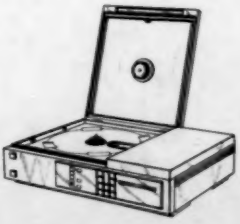


270,630
VIDEO GAME CONTROL UNIT OR THE LIKE
Jeffrey M. Moskin, 3106 Barry Ave., Los Angeles, Calif. 90066, and Keith J. Wertz, 2533 S. Deegan Dr., Santa Ana, Calif. 92704
Filed Jun. 4, 1982, Ser. No. 384,900
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

270,631
VIDEO GAME CONTROL GRIP OR THE LIKE
Jeffrey M. Moskin, 3106 Barry Ave., Los Angeles, Calif. 90066, and Keith J. Wertz, 2533 S. Deegan Dr., Santa Ana, Calif. 92704
Filed Jun. 4, 1982, Ser. No. 384,901
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

270,632
VIDEO DISC PLAYER
Hideaki Kurata; Hirokazu Hamano, and Hiroshi Shindo, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 15, 1981, Ser. No. 273,810
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

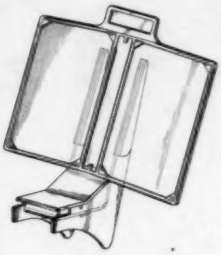
270,633
VIDEO DISC PLAYER
Hiroshi Shindo; Hideaki Kurata, and Hirokazu Hamano, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 15, 1981, Ser. No. 273,811
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1



270,634
HEADPHONES
Leon B. Ungar, Malibu, Calif., assignor to Culver Electronic Sales, Inc., Gardena, Calif.
Filed Jun. 29, 1981, Ser. No. 278,743
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—36

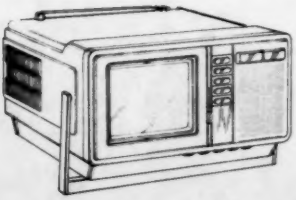
270,635
CORDLESS TELEPHONE HANDSET
Richard E. Bloem, Sr., Arcadia, Calif., assignor to American Telecommunications Corporation, El Monte, Calif.
Filed Mar. 23, 1981, Ser. No. 246,403
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—64

270,636
EASEL FOR ATTACHING TO A TELEPHONE TO SUPPORT A BOOK OR THE LIKE
Thomas V. Foreman, Sr., 17706 Carelia La., Spring, Tex. 77379
Filed Dec. 6, 1979, Ser. No. 97,143
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65

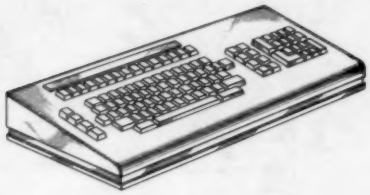


270,637
DIALING PAD
Hisao Fukushima, and Masaharu Tarao, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1981, Ser. No. 280,286
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

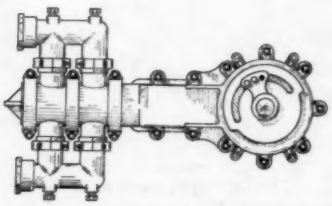
270,638
TELEVISION RECEIVER
Akira Takahashi; Yasusuke Seki, and Takeshi Abe, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 12, 1979, Ser. No. 47,922
Claims priority, application Japan, Dec. 12, 1978, 53-54226
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



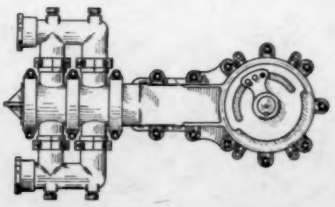
270,639
COMPUTER KEYBOARD
John W. Goodin, Long Beach, and David A. Sharbaugh, Irvine, both of Calif., assignors to USAC Electronics Industry Co., Ltd., Unokemachi, Japan
Filed May 18, 1981, Ser. No. 264,651
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100



270,640
LIQUID MANURE PUMP
Ernest C. Hollander, Boyden, Iowa, assignor to Dethmers Manufacturing Company, Boyden, Iowa
Filed Jun. 18, 1981, Ser. No. 275,136
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

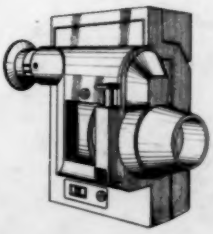


270,641
LIQUID MANURE PUMP
Ernest C. Hollander, Boyden, Iowa, assignor to Dethmers Manufacturing Company, Boyden, Iowa
Filed Jun. 19, 1981, Ser. No. 275,358
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



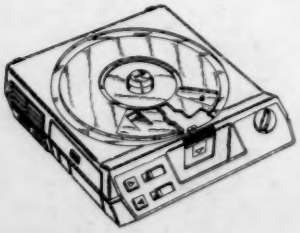
270,642
ABRASIVE BLASTING WHEEL PIN
W. David Watts, P.O. Box 48474, Atlanta, Ga. 30362
Filed Feb. 3, 1981, Ser. No. 231,246
Term of patent 14 years
Int. Cl. D15—*09*; D8—*06, 08*
U.S. Cl. D15—126

270,643
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
Enrique Alie, Brooklyn, N.Y.; Donald R. Bishop, Westwood, Mass., and James M. Ryan, New York, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 199,853, Oct. 23, 1980, Pat. No. Des. 268,267. This application Mar. 17, 1981, Ser. No. 244,642
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



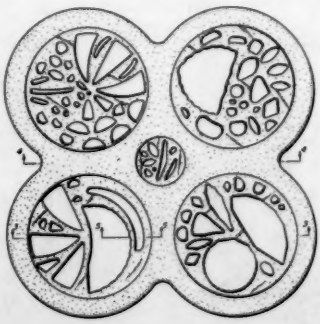
270,644
MICROFILM VIEWER
William C. Kinney, Kennesaw, Ga., assignor to Grayscale Labs, Inc., Marietta, Ga.
Filed Apr. 24, 1981, Ser. No. 257,006
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—14

270,645
SLIDE PROJECTOR OR SIMILAR ARTICLE
Richard K. Weiss, Mansfield, Ohio, and Richard J. Olson, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 5, 1981, Ser. No. 240,743
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21

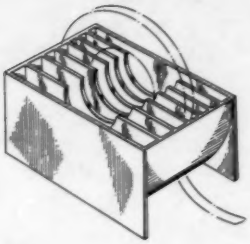


270,646
ELECTRONIC CALCULATOR
Keiji Sakata, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jul. 10, 1981, Ser. No. 282,096
Claims priority, application Japan, Dec. 24, 1980, 55-1127
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

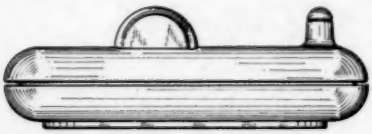
270,647
DRAWING TEMPLATE
Denys Fisher, Kirkconnel Lea, Glencaple, Dumfries, DG1 4RG, Scotland
Filed Sep. 11, 1980, Ser. No. 186,052
Claims priority, application United Kingdom, Jun. 20, 1980, 995391
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—39



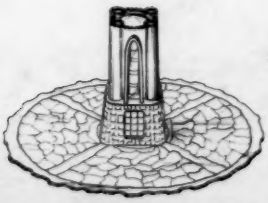
270,648
COMBINED HOLDER AND DISPENSER FOR ROLLS OF TAPE
Gene L. Mayo, 135 Dolton Ave., San Carlos, Calif. 94070
Filed Jun. 22, 1981, Ser. No. 276,090
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—67



270,649
TAPE DISPENSER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Sep. 25, 1981, Ser. No. 305,515
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69

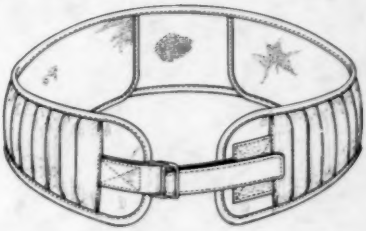


270,650
GAME BOARD
Vincent A. A. J. Erato, Hatfield, Mass., assignor to Milton Bradley International, Inc., Springfield, Mass.
Filed Mar. 19, 1981, Ser. No. 245,619
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—31



270,651
STUFFED CLOWN DOLL
Cynthia B. Wilkerson, P.O. Box 532, Crowley, La. 70526
Filed May 11, 1981, Ser. No. 262,486
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—173

270,652
EXERCISE BELT
Edith Winston, 135 Hazelwood Dr., Jericho, N.Y. 11753
Filed Jun. 15, 1981, Ser. No. 273,981
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—196



270,653
CAMEL FIGURE PLAYGROUND CLIMBER
James E. Miller, 655 Ridgedale, Birmingham, Mich. 48008
Filed Mar. 16, 1981, Ser. No. 244,148
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245

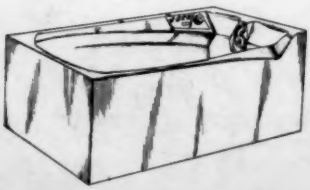
270,654
THROWING AX
James Barrett, 333 Rauhut, St. Louis, Mo. 63125
Filed Jul. 13, 1981, Ser. No. 282,940
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1

270,655
COMBINATION KNIFE AND UTILITY TOOL WITH PIVOTAL BLADE COVER
Walter W. Collins, Rock Hill, S.C., assignor to Jenkins Metal Corporation, Gastonia, N.C.
Filed Jul. 30, 1981, Ser. No. 288,911
Term of patent 14 years
Int. Cl. D8—*03;* D22—*05*
U.S. Cl. D22—1

270,656
DUCK DECOY STABILIZER FOR USE IN STORMY WEATHER
Chris Fulster, 2810 3rd Ave., Sacramento, Calif. 95818
Filed Nov. 4, 1981, Ser. No. 318,250
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—18

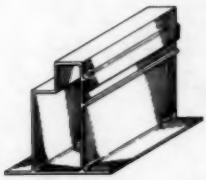
270,657
SPRAYER
Franco Clivio, and Dieter Raffler, both of Ulm, Fed. Rep. of Germany, assignors to GARDENA Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Jan. 30, 1981, Ser. No. 230,148
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 1244/80
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—37

270,658
BATHTUB
Arthur A. Sills; John H. Kraft; Raymond T. Houle, all of Traverse City, Mich.; Stewart D. Reed, El Toro, Calif.; Michael A. Redwine, Acme, and Fredrick A. Kilborn, Suttons Bay, both of Mich., assignors to Silchor, Traverse City, Mich.
Filed Sep. 15, 1980, Ser. No. 187,337
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

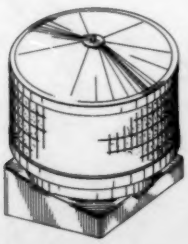


270,659
WATER SAVER FOR A TOILET FLUSH SYSTEM
John Marmon, 2597 Hinda Rd., Lake Park, Fla. 33403, and Evan Davies, 1130 SW. 6th St., Ft. Lauderdale, Fla. 33312
Filed Feb. 27, 1981, Ser. No. 238,933
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

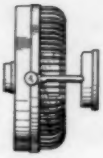
270,660
FRAME MEMBER FOR A SOLAR COLLECTOR
Sterling L. Ort, R.D. #1, Box #14, Lewisberry, Pa. 17339
Filed Mar. 24, 1981, Ser. No. 247,121
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



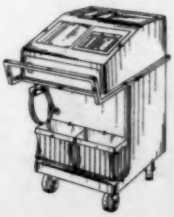
270,661
EVAPORATIVE COOLER
Julian K. Pettengill, 4243 W. Ironwood, Phoenix, Ariz. 85021
Filed Apr. 3, 1981, Ser. No. 250,832
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



270,662
FAN
Arthur Scotto, 619 Shore Rd., N. Palm Beach, Fla. 33408
Filed Aug. 26, 1982, Ser. No. 411,614
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155

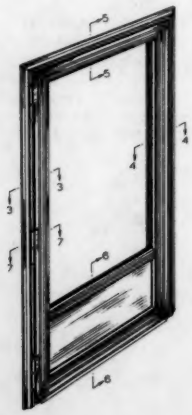


270,663
ELECTROCARDIOGRAPH
Walter W. Wiebe, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 951,217, Oct. 13, 1978, Pat. No. Des. 260,173. This application Mar. 10, 1981, Ser. No. 242,512
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—17

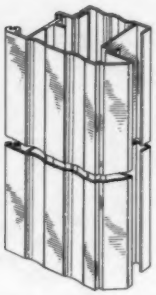


270,664
INFANT TEETHING TOY
Harold J. Greenberg, and Irma S. Greenberg, both of P.O. Box 450, Dyersburg, Tenn. 38024
Filed Mar. 2, 1981, Ser. No. 239,885
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45

270,665
COMBINED DOOR AND FRAME STRUCTURE
Ernesto Cascone, 279 Cocksfield Ave., Downsview, Ontario, Canada M3H 3T8, and Vincent Cascone, 36 Mayvern Crescent, Richmond Hill, Ontario, Canada L4C 5J4
Filed Apr. 7, 1981, Ser. No. 251,996
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



270,666
DOOR FRAME MEMBER
Ernesto Cascone, 279 Cocksfield Ave., Downsview, Ontario, Canada M3H 3T8, and Vincent Cascone, 36 Mayvern Crescent, Richmond Hill, Ontario, Canada L4C 5J4
Filed Apr. 7, 1981, Ser. No. 251,994
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



270,667
DOOR FRAME MEMBER
Ernesto Cascone, 279 Cocksfield Ave., Downsview, Ontario, Canada M3H 3T8, and Vincent Cascone, 36 Mayvern Crescent, Richmond Hill, Ontario, Canada L4C 5J4
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Term of patent 14 years
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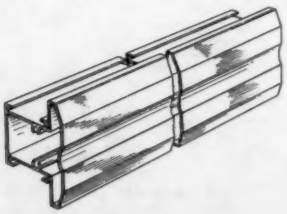
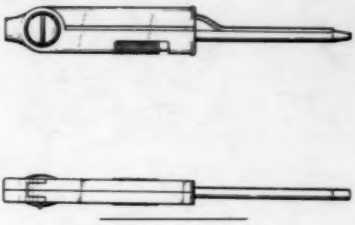
U.S. Cl. D25—75



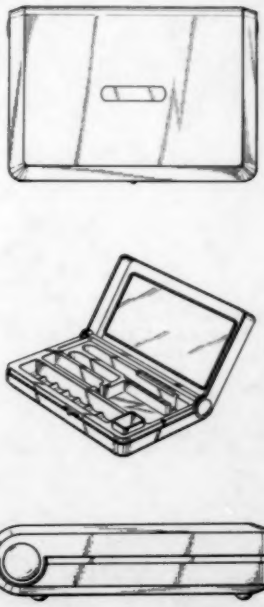
270,668
DECORATIVE COMPOSITE GLASS PANEL
B. Jeremiah Shaffer, Worthington, and William T. Russell, Columbus, both of Ohio, assignors to Pease Company, Fairfield, Ohio
Filed Jul. 20, 1981, Ser. No. 285,210
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—72

270,669
COSMETIC APPLICATOR WITH UNIVERSAL JOINT
Henry J. Cassai, 95-15 107 St., Ozone Park, N.Y. 11416, and Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236
Filed Jan. 11, 1982, Ser. No. 338,717
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

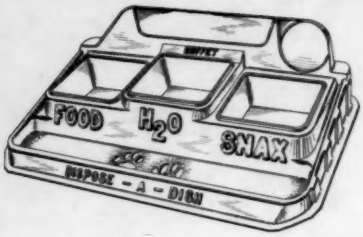
270,670
HAIR IRON
Akio Goto; Kuniharu Ichikawa, both of Kyoto, and Keiji Kuribayashi, Ueno, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jun. 14, 1982, Ser. No. 378,194
Claims priority, application Japan, Nov. 30, 1981, 56-53146
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



270,671
CASE FOR A HAIR ROLLER SET
Shinji Yamamoto, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Apr. 17, 1981, Ser. No. 255,181
Claims priority, application Japan, Nov. 14, 1980, 55-47815
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—38

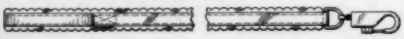


270,672
PET FOOD TRAY
Alan Zelinger, Monsey, N.Y., assignor to Ethical Products, Inc., Newark, N.J.
Filed Jul. 2, 1981, Ser. No. 279,838
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16

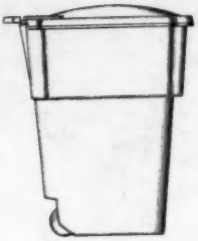


270,673
ANIMAL TAG
Lois M. Erdmann, P.O. Box 1063, Minot, N. Dak. 58701
Filed Jul. 2, 1981, Ser. No. 279,773
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43

270,674
ANIMAL LEASH
Lois M. Erdmann, P.O. Box 1063, Minot, N. Dak. 58701
Filed Jul. 2, 1981, Ser. No. 279,777
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—39



270,675
RECEPTACLE
Bruce H. Parker, Valencia, Calif., assignor to Turn-Key Container Systems, Inc., Sepulveda, Calif.
Filed Apr. 13, 1981, Ser. No. 253,225
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D34—5



270,676
GARBAGE CONTAINER
Patrick F. Pease, 618 Bent Tree, Euless, Tex. 76039
Filed Jul. 9, 1981, Ser. No. 281,909
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D34—7

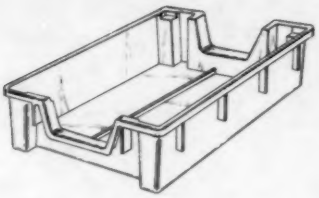
270,677
WASTE RECEPTACLE
E. J. Creske, Wausau Tile, P.O. Box 1520, Wausau, Wis. 54401
Filed Oct. 23, 1981, Ser. No. 314,404
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D34—8

270,678

CARRYING TRAY

Eric D. Stein, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio

Filed Mar. 26, 1981, Ser. No. 247,912
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Bahco Verktyg: *See—*
Jansson, Conny; Erlandsson, Lars; and Appelkvist, Rolf, 4,404,746, Cl. 30-124.000.

AB Carl Munters: *See—*
Norback, Per; and Eriksson, Borje, 4,405,533, Cl. 261-111.000.

Ab Volvo: *See—*
Ternehall, Runo R. O., 4,405,038, Cl. 192-4.00B.

Abbott Laboratories: *See—*
Cherot, Harrison, 4,405,053, Cl. 215-32.000.
Gross, James R.; and Larkin, Mark E., 4,405,312, Cl. 604-29.000.

Abe, Hitoshi, to Kyoritsu Seiki Corporation. Tool head. 4,405,268, Cl. 408-182.000.

Abe, Katsuo: *See—*
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Abe, Masahiro: *See—*
Koshino, Yutaka; Ajima, Takashi; Ohshima, Jiro; and Abe, Masahiro, 4,404,736, Cl. 29-576.00W.

Abel, Heinz; and Hugelshofer, Paul, to Ciba-Geigy Corporation. Stable concentrated fluid formulations of metal-free dyes, process for their preparation, and their use. 4,405,329, Cl. 8-527.000.

Abraham, John K.: *See—*
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., 4,405,380, Cl. 148-2.000.

Abrams, Burton S.; and Zeger, Andrew E., to United States of America, Army. VHF Sensor in-band radio relay. 4,406,016, Cl. 455-19.000.

Accademia Bulgara delle Scienze: *See—*
Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, 4,405,695, Cl. 429-103.000.

ACF Industries, Incorporated: *See—*
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,405,168, Cl. 294-103.00R.

Achtnig, Klaus-Peter: *See—*
Muller, Manfred; and Achtnig, Klaus-Peter, 4,405,187, Cl. 339-14.00R.

Acres American Incorporated: *See—*
Blaustein, Eric W.; and Patton, Edward J., 4,405,331, Cl. 44-1.00D.

Acrow Limited: *See—*
Tooley, Jack R., 4,405,254, Cl. 403-246.000.

Adams, Albert. Convertible rail-highway vehicle chassis. 4,405,271, Cl. 410-53.000.

Adams, Richard C.: *See—*
Koch, Paul E.; Bond, Thomas J.; and Adams, Richard C., 4,405,547, Cl. 264-171.000.

Adeka Argus Chemical Co., Ltd.: *See—*
Hirai, Bunji; Kubota, Naohiro; and Sugibuchi, Kazuo, 4,405,737, Cl. 524-102.000.
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Nakahara, Yutaka, 4,405,736, Cl. 524-102.000.

Adleman, Leonard M.: *See—*
Rivest, Ronald L.; Shamir, Adi; and Adleman, Leonard M., 4,405,829, Cl. 178-22.100.

Adler, Marianne: *See—*
Ferneau, Richard H., 4,405,172, Cl. 296-20.000.

Adler, Teri A. Baby bottle holder. 4,405,106, Cl. 248-102.000.

Adolphi, Heinrich: *See—*
Loeffler, Hans-Peter; Seufert, Walter; and Adolphi, Heinrich, 4,405,614, Cl. 424-215.000.

Adria Laboratories Inc.: *See—*
Mitscher, Lester A., 4,405,522, Cl. 260-365.000.

AEL Microtel Ltd.: *See—*
Taylor, Alistair W.; Fikart, Josef; and Thompson, David, 4,405,897, Cl. 324-782.000.

Agence Nationale de Valorisation de La Recherche (A.N.V.A.R.): *See—*
Aries, Lucien; and Traverse, Jean-Pierre, 4,405,414, Cl. 204-56.00R.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Honjo, Kuniaki; and Shindo, Akio, 4,405,685, Cl. 428-368.000.

Aihara, Toshiharu; Tahara, Iwao; Matsuo, Yushin; Takahashi, Naoki; Wakabayashi, Takuo, deceased; and Wakabayashi, Shigemasa, executor, to Casio Computer Co., Ltd. Electronic device having timepiece function. 4,405,241, Cl. 368-63.000.

Air Preheater Company, Inc., The: *See—*
Stockman, Richard F., 4,405,011, Cl. 165-10.000.

Air Products and Chemicals, Inc.: *See—*
Wells, James E., 4,405,784, Cl. 544-352.000.

Aiuchi, Susumu: *See—*
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Ajima, Takashi: *See—*
Koshino, Yutaka; Ajima, Takashi; Ohshima, Jiro; and Abe, Masahiro, 4,404,736, Cl. 29-576.00W.

Akasaka, Yoshimichi: *See—*
Nakamura, Ichiro; Takenoshita, Mitsuaki; Ichiryu, Ken; Akasaka, Yoshimichi; and Watanabe, Haruo, 4,404,892, Cl. 91-396.000.

Akita, Sigeyuki, to Nippon Soken, Inc. Transformer coupled position detecting apparatus with phase change detector. 4,405,896, Cl. 324-208.000.

Akzona, Incorporated: *See—*
Jaschek, Juergen; and Krummheuer, Wolf, 4,405,341, Cl. 51-298.000.
McNeely, Gerald W., 4,405,738, Cl. 524-116.000.
Schwartz, William B., 4,405,188, Cl. 339-17.0CF.
Seibert, Karl, 4,405,641, Cl. 424-305.000.

Albarda, Scato, to Dragerwerk AG. Dosing pump. 4,405,294, Cl. 417-488.000.

Alberts, Heinrich: *See—*
Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, 4,405,742, Cl. 524-315.000.

Albrecht, Gunter; Sickinger, Albert; and Schmuhl, Hans-Jurgen, to MTU Motoren-Und-Turbinen-Union Munchen GmbH. Casing for a thermal turbomachine having a heat-insulating liner. 4,405,284, Cl. 415-174.000.

Albrecht, Joachim; Duerig, Thomas; and Weber, Walter, to BBC Brown, Boveri & Company Limited. Process to produce a reversible two-way shape memory effect in a component made from a material showing a one-way shape memory effect. 4,405,387, Cl. 148-11.50R.

Alcan International Limited: *See—*
Dewing, Ernest W.; and Gesing, Adam J., 4,405,415, Cl. 204-67.000.

Alheid, Robert J., to Beloit Corporation. Blade type fountain coater and method. 4,405,661, Cl. 427-356.000.

Allard, Rene; Couture, Fernand; and Couture, Raynald, to La Compagnie Normand Ltee. Farm wagon. 4,405,169, Cl. 296-3.000.

Allart, Bernard R.; Lallier, Jean-Claude; and Noel, Alain W., to Poclain Hydraulics. Pressurized fluid engine equipped with means for selecting its speed of rotation. 4,404,896, Cl. 91-491.000.

Allen-Bradley Company: *See—*
Reichert, Gilbert A.; and Pankowski, Richard A., 4,405,826, Cl. 174-59.000.

Allen, Richard G.; and Glaser, Mark C., to Baker International Corporation. Positive locating expendable plug. 4,405,017, Cl. 166-382.000.

Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., to American Can Company. Press transfer bar. 4,404,837, Cl. 72-349.000.

Allied Corporation: *See—*
DeCristofaro, Nicholas J., 4,405,391, Cl. 148-403.000.
Nalewajek, David, 4,405,568, Cl. 423-21.100.
Sieja, Norman F., 4,404,940, Cl. 123-335.000.

Allis-Chalmers Corporation: *See—*
Faulkner, Bobby P.; and Weinecke, Michael H., 4,405,438, Cl. 208-11.00R.

Alps Electric Co., Ltd.: *See—*
Fujisawa, Kyuichi, 4,405,931, Cl. 346-139.00R.
Kondo, Shiro; and Mizuta, Ken, 4,405,845, Cl. 200-67.0DB.

Alstetter, Franz: *See—*
Hultsch, Gunther; Alstetter, Franz; and Breuer, Uwe, 4,405,454, Cl. 209-279.000.

Alusuisse Italia S.p.A.: *See—*
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,405,505, Cl. 252-461.000.

Alverson, Frederick C.: *See—*
Neale, Thomas J.; Alverson, Frederick C.; and Karg, John S., 4,405,561, Cl. 422-145.000.

Amer Sport International Inc.: *See—*
Farquharson, Charles R., 4,404,690, Cl. 2-420.000.

American Can Company: *See—*
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,404,837, Cl. 72-349.000.
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,405,667, Cl. 428-35.000.
Phalin, Thomas L., 4,405,058, Cl. 220-458.000.

American Cyanamid Company: *See—*
Kamhi, Victor M., 4,405,513, Cl. 252-700.000.
Siddens, Jack K.; and Raghu, Sivaraman, 4,405,529, Cl. 260-465.00F.

American Hospital Supply Corporation: *See*—
Hsei, Paul K., 4,405,060, Cl. 221-135.000.
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,405,642, Cl. 424-309.000.
American Standard Inc.: *See*—
Bridigum, Robert J.; and Johnston, William S., 4,404,987, Cl. 137-556.000.
Hart, James E., 4,405,182, Cl. 303-23.00R.
Ammonia Casale S.A.: *See*—
Zardi, Umberto; and Comandini, Ettore, 4,405,562, Cl. 422-148.000.
AMP Incorporated: *See*—
Brandewie, Joseph E.; and Hart, Granville S., 4,404,743, Cl. 29-857.000.
Cherry, Hitesh; Mueller, Arthur L.; and Werner, Walter M., 4,405,195, Cl. 339-252.00R.
Douty, George H.; Ritchie, Leon T.; and Snyder, Clair W., Jr., 4,405,189, Cl. 339-17.00C.
Eaby, Daniel G.; and Shuey, John R., 4,405,192, Cl. 339-91.00R.
Mixon, James L., Jr., 4,405,827, Cl. 174-94.00R.
Weidler, Charles H., 4,405,193, Cl. 339-99.00R.
AMSTED Industries Incorporated: *See*—
Fujii, Tetsuya; Oguchi, Yukio; Sumita, Norio; and Goto, Isamu, 4,405,295, Cl. 419-28.000.
Anaconda-Ericsson, Inc.: *See*—
Hall, Jay D.; Stump, Theodore M.; and Thode, Charles W., 4,406,004, Cl. 370-15.000.
Anaren Microwave, Inc.: *See*—
Gerst, Carl W.; Paciorek, Leonard J.; and Sly, Thomas L., 4,405,895, Cl. 324-83.00D.
Andeen, Bruce R., to Helix Technology Corporation. Cryogenic refrigerator with non-metallic regenerative heat exchanger. 4,404,808, Cl. 62-6.000.
Andersen, Torkil K. Device for straightening of pipes. 4,404,833, Cl. 72-216.000.
Anderson, Stephen P.: *See*—
Schoenberg, Jules E.; and Anderson, Stephen P., 4,405,770, Cl. 526-259.000.
Ando, Masao; Hirota, Tetsuya; and Shioda, Katashi, to Mitsubishi Chemical Industries Limited. Adsorption separation apparatus. 4,405,455, Cl. 210-191.000.
Andrade, Thomas L., to International Business Machines Corporation. Self-aligned extended epitaxy mesfet fabrication process. 4,404,732, Cl. 29-571.000.
Andrews, Roderic S.: *See*—
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,405,800, Cl. 549-419.000.
Anelva Corporation: *See*—
Kobayashi, Haruhiro; Funaki, Hidefumi; and Sakurai, Takehiro, 4,405,436, Cl. 204-298.000.
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.
Tsukada, Tsutomu; and Ukai, Katsumi, 4,405,989, Cl. 364-525.000.
Angyan, Sandor; Racz, Istvan; Radvanyi, Erzsebet; Kovats, Ferenc; Detre, Tamas; and Sos, Jozsef, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Carbofuran-containing plant protecting compositions. 4,405,353, Cl. 11-3.000.
Antlfinger, George J.; and Shah, Pravinchandra K., to B. F. Goodrich Company, The. Hydrophobic nonwoven fabric bonded by a copolymer formed from a diene. 4,405,325, Cl. 604-370.000.
Antonov, Vladimir I.: *See*—
Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.
Aoto, Yoshiyuki: *See*—
Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.
Appel, David W.; and Morman, Michael T., to Kimberly-Clark Corporation. Apparatus for forming nonwoven webs. 4,405,297, Cl. 425-72.00S.
Appelkvist, Rolf: *See*—
Jansson, Conny; Erlandsson, Lars; and Appelkvist, Rolf, 4,404,746, Cl. 30-124.000.
Arahara, Kohzoh: *See*—
Morita, Minoru; Hosokawa, Etsuo; and Arahara, Kohzoh, 4,405,687, Cl. 428-383.000.
Arai, Hajime: *See*—
Numazawa, Akio; and Arai, Hajime, 4,404,869, Cl. 74-740.000.
Arai, Toshio: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.
Araujo, Roger J.; Borrelli, Nicholas F.; Tick, Paul A.; and Trotter, Donald M., to Corning Glass Works. Composite photochromic glass article and method of making. 4,405,672, Cl. 428-68.000.
Aries, Lucien; and Traverse, Jean-Pierre, to Agence Nationale de Valorisation de La Recherche (A.N.V.A.R.). Process for manufacturing a selective absorber of a solar collector and selective absorber so obtained. 4,405,414, Cl. 204-56.00R.
Arika, Junji: *See*—
Miyazaki, Hiroshi; and Arika, Junji, 4,405,484, Cl. 252-174.250.
Arimatu, Toshiharu: *See*—
Tajiri, Koji; and Arimatu, Toshiharu, 4,404,718, Cl. 28-220.000.
Arimoto, Kunio: *See*—
Zinkel, Duane F.; and Arimoto, Kunio, 4,405,514, Cl. 260-102.000.
Armco Inc.: *See*—
Hall, Douglas D., 4,405,263, Cl. 405-224.000.
James, Robert G., 4,404,863, Cl. 74-89.200.
Lawson, John E., 4,405,261, Cl. 405-227.000.
Armstrong World Industries, Inc.: *See*—
Miller, Jesse D., Jr.; and Petzold, James R., 4,405,657, Cl. 427-54.100.
Valenti, James P., 4,404,981, Cl. 137-67.000.
Arno', Mario; and Costa, Bruno, to Nuova Italsider S.p.A. Process of refining iron in oxygen converters with additions of materials containing sodium carbonate. 4,405,364, Cl. 75-52.000.
Arnold & Richter Cinetechnik GmbH, & Co. Betriebs KG: *See*—
Blaschek, Otto, 4,405,070, Cl. 226-55.000.
Aron, Mitchell; and Sosinsky, Emanuel, to Bendix Corporation, The. Method for making a direction sensitive contrast enhancement filter. 4,405,939, Cl. 358-65.000.
Artes, Reinhold: *See*—
John, Peter; Artes, Reinhold; Frey, Volker; and Scherer, Matthias, 4,405,804, Cl. 556-476.000.
Asahi Glass Company Ltd.: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.
Nakaya, Keiichi; Kawanami, Kohji; and Hirata, Suekazu, 4,405,592, Cl. 423-421.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Takemura, Reiji, 4,405,418, Cl. 204-95.000.
Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, to Honda Giken Kogyo Kabushiki Kaisha. Rotary valve in an internal combustion engine. 4,404,934, Cl. 123-190.0BD.
Asakura, Akira: *See*—
Yoshioka, Shigehiko; Yamada, Hideto; and Asakura, Akira, 4,405,408, Cl. 162-158.000.
Asami, Ken, to Toyota Jidosha K.K. Method of controlling the rotational speed of a rotary shaft. 4,404,942, Cl. 123-352.000.
ASEA Aktiebolag: *See*—
Hagg, Rune; and Lundstrom, Lennart, 4,404,740, Cl. 29-606.000.
Lovgren, Goran; and Rothman, Bengt, 4,405,553, Cl. 264-272.190.
Ash, Stephen R.: *See*—
Handt, Alan E., 4,405,315, Cl. 604-80.000.
Ashida, Kazutaka, to Victor Company of Japan, Ltd. Apparatus for stopping rotation of tape reels. 4,405,883, Cl. 318-6.000.
Ashland Oil, Inc.: *See*—
Kovach, Stephen M.; and Cornelius, Edward B., 4,405,445, Cl. 208-120.000.
Zandona, Oliver J., 4,405,444, Cl. 208-113.000.
Ashworth, Robert A.: *See*—
Rodriguez, Larry A.; Padilla, Antonio A.; Ashworth, Robert A.; and Spake, Ned B., 4,405,332, Cl. 44-51.000.
Asulab S.A.: *See*—
Luscher, Jakob, 4,405,906, Cl. 331-116.0FE.
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, to Hitachi, Ltd. Photoelectric conversion device and method of producing the same. 4,405,879, Cl. 313-386.000.
Atherton, Linda: *See*—
Kulik, Conrad J.; and Atherton, Linda, 4,405,437, Cl. 208-10.000.
Atlas Copco Aktiebolag: *See*—
van Oorschot, Gosewinus F., 4,405,345, Cl. 55-184.000.
Atsumi, Masataka: *See*—
Katano, Seiji; and Atsumi, Masataka, 4,405,709, Cl. 430-307.000.
Atsumi, Shin-Ichi; Sasaki, Masayuki; and Kitamura, Ikuo, to Nisshin Flour Milling Co., Ltd. Method for producing bread. 4,405,648, Cl. 426-19.000.
Atumaru, Ayakazu. Reciprocator for paint gun. 4,404,870, Cl. 74-829.000.
Audi Nsu Union Aktiengesellschaft: *See*—
Leitermann, Wulf, 4,404,937, Cl. 123-198.00F.
Leitermann, Wulf, 4,404,937, Cl. 123-198.00F.
Auding, Rudolf: *See*—
Ruhnau, Gerhard; Grubert, Klaus; Hesse, Karl-Heinz; and Auding, Rudolf, 4,405,982, Cl. 364-200.000.
Auerbach, Sidney. Sanitary napkin. 4,405,323, Cl. 604-285.000.
Ausonia Farmaceutici s.r.l.: *See*—
Di Schiena, Michele; and Orru, Vittoria, 4,405,618, Cl. 424-246.000.
Austin, Ronald, to Duo-Fast Corporation. Fastener driving tool. 4,405,071, Cl. 227-7.000.
Auto Stop Corporation: *See*—
Fuller, William J., 4,405,000, Cl. 141-198.000.
Automatic Switch Company: *See*—
Moakler, William A.; and Ringstad, Ralph H., 4,405,867, Cl. 307-64.000.
Automotive Products Limited: *See*—
Broadbent, George T., 4,405,041, Cl. 192-98.000.
Avery, Leslie R., to RCA Corporation. Protective integrated circuit device utilizing back-to-back zener diodes. 4,405,933, Cl. 357-13.000.
Avibank Mfg., Inc.: *See*—
Duran, John A., 4,404,714, Cl. 24-230.0AL.
Avon Products, Inc.: *See*—
Rogers, Jack M.; Tokosh, Richard; Porter, Charles; and Martine, James, 4,405,509, Cl. 252-522.00A.
Awater, Albert: *See*—
Recker, Klaus; Reinecke, Gerd; Awater, Albert; Grogler, Gerhard; and Kraft, Karl J., 4,405,752, Cl. 524-847.000.
Ayata, Naoki: *See*—
Hirai, Yutaka; Hatanaka, Katsunori; Ayata, Naoki; and Uzawa, Shunichi, 4,405,857, Cl. 250-211.00J.

Ayerst, McKenna and Harrison Limited: *See*—
Lippmann, Wilbur, 4,405,625, Cl. 424-258.000.

B. F. Goodrich Company, The: *See*—
Antlfinger, George J.; and Shah, Pravinchandra K., 4,405,325, Cl. 604-370.000.
Gibson, Richard J.; and Fogel, Joseph, 4,405,375, Cl. 106-277.000.
Jablonski, Dane E., 4,405,758, Cl. 525-329.800.
Murphy, Walter T.; and Guiley, Clifford D., Jr., 4,405,817, Cl. 568-701.000.

Bacal, Kazimierz; Wierusz, Lech; and Kossek, Stanislaw, to Wyzsza Szkola Inzynierska Im. Jurija Gagarina. Surgical strut for treatment of the back-bone. 4,404,967, Cl. 128-69.000.

Backus, John K.: *See*—
Bernard, David L.; Backus, John K.; and Doheny, Anthony J., Jr., 4,405,725, Cl. 521-112.000.

Bader, Henry; and Chiang, Yunn H., to Polaroid Corporation. Method for preparing salts of 6-chloropurine. 4,405,781, Cl. 544-264.000.

Badger, Stephen L., to Wansley, Tandy. Fuel composition. 4,405,336, Cl. 44-56.000.

Baglioni, Alessandro: *See*—
Sportoletti, Giancarlo; and Baglioni, Alessandro, 4,405,643, Cl. 424-311.000.

Bahiman, Hossein. Unidirectional flexural pivot. 4,405,184, Cl. 308-2.00A.

Bahr, Theodor; Heinrich, Hans-Otto; and Thumm, Helmut, to J. M. Voith GmbH. Apparatus for the production of mechanical wood pulp. 4,405,091, Cl. 241-33.000.

Baier, Alfred; Lucht, Alfred; Munch, Gerhard; and Pfeuffer, Alfred, to Messer Griesheim GmbH. Scarfing burner arrangement. 4,405,382, Cl. 148-9.00R.

Bailey, Thomas D.: *See*—
McGill, Charles K.; and Bailey, Thomas D., 4,405,790, Cl. 546-304.000.

Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, to Hitachi, Ltd. Solid-state imaging device. 4,405,935, Cl. 357-31.000.

Baker International Corporation: *See*—
Allen, Richard G.; and Glaser, Mark C., 4,405,017, Cl. 166-382.000.

Baker Perkins Holdings Limited: *See*—
Hazelwood, Geoffrey, 4,404,787, Cl. 53-502.000.

Balasubramanyam, Karanam; and Ruoff, Arthur L., to Cornell Research Foundation, Inc. Ion beam exposure of (g-Ge_xSe_{1-x}) inorganic resists. 4,405,710, Cl. 430-311.000.

Baldwin, Gary L.: *See*—
Hornak, Thomas; and Baldwin, Gary L., 4,405,916, Cl. 340-347.0DA.

Baldwin, Roger A.; Stauter, John C.; and Terrell, Donald L., to Kerr-McGee Nuclear Corporation. Process for the removal of selenium from aqueous systems. 4,405,464, Cl. 210-717.000.

Ball, Douglas C.; Stumpf, William S.; and Ludwig, Gary R., to Hauserman Ltd. Hanging components for space divider system. 4,404,776, Cl. 52-29.000.

Ball, Lawrence E.: *See*—
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,405,777, Cl. 528-323.000.

Ballweg, Achim: *See*—
Tusel, Gunter; and Ballweg, Achim, 4,405,409, Cl. 202-200.000.

BancOhio National Bank: *See*—
Roman, Walter C., 4,405,451, Cl. 209-136.000.

Banks, Edward L.; Truax, Bruce E.; and Watkins, Laurence S., to Western Electric Co. Methods of fabricating a photomask. 4,405,701, Cl. 430-5.000.

Barba, Robert L., to Sterling Drug, Inc. Unit package for poultry vaccination. 4,405,047, Cl. 206-570.000.

Barber, Loren L., Jr.: *See*—
Young, Chung I.; and Barber, Loren L., Jr., 4,405,497, Cl. 252-431.00R.

Barber, William R., Jr.: *See*—
Hahn, Frecerick C.; Barber, William R., Jr.; and Hampel, David A., 4,404,760, Cl. 37-142.00R.

Barclay, John L.; Hargrove, John D.; and Prince, Richard J., to British Petroleum Company Limited, The. Production of zeolite agglomerates. 4,405,503, Cl. 252-455.00Z.

Barnard, John; and Bloombaum, Barry D., to Imperial Chemical Industries PLC. Process for providing color contrast on surface of moulded article. 4,405,551, Cl. 264-245.000.

Barnhoorn, Adrianus J. M.: *See*—
Raudenbusch, Werner T.; Barnhoorn, Adrianus J. M.; Kooijmans, Petrus G.; Sederel, Willem L.; Van Steenis, Adrianus M. C.; and Schets, Theresia F. M., 4,405,662, Cl. 427-386.000.

Baron, Klaus U.: *See*—
Hoffmann, Hartmut; and Baron, Klaus U., 4,405,200, Cl. 350-96.210.

Barr, Robert A.: *See*—
Chung, Chan I.; and Barr, Robert A., 4,405,239, Cl. 366-89.000.

Barr & Stroud Limited: *See*—
McAlpine, Frederick W., 4,404,890, Cl. 89-41.00E.

Bartha, Laszlo: *See*—
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, 4,405,571, Cl. 423-53.000.

Barthold, Klaus: *See*—
Oppenlaender, Knut; Schwartz, Erich; Barthold, Klaus; and Slotman, Wilhelmus, 4,405,494, Cl. 252-392.000.

BASF Aktiengesellschaft: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,405,330, Cl. 8-639.000.
Demmler, Kurt; and Ochs, Wolfram, 4,405,765, Cl. 525-506.000.
Loeffler, Hans-Peter; Seufert, Walter; and Adolphi, Heinrich, 4,405,614, Cl. 424-215.000.
Oppenlaender, Knut; Schwartz, Erich; Barthold, Klaus; and Slotman, Wilhelmus, 4,405,494, Cl. 252-392.000.
Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, 4,405,358, Cl. 71-98.000.

Bates, J. Frederick: *See*—
Stech, Eric N.; Montgomery, Mark S.; and Bates, J. Frederick, 4,405,809, Cl. 562-487.000.

Battelle Development Corporation: *See*—
Rodgers, Stephen D.; Dick, Richard J.; and McGinniss, Vincent D., 4,405,761, Cl. 525-404.000.

Battelle Memorial Institute: *See*—
Raman, Ramaswamy V.; and Maringer, Robert E., 4,405,535, Cl. 264-11.000.

Bauch, Tamil D.: *See*—
Zinn, Michael; Bauch, Tamil D.; and Schiff, Morton, 4,404,962, Cl. 126-450.000.

Bauer, William V., to Lummus Company, The. Iron ore direct reduction waste treatment. 4,405,362, Cl. 75-24.000.

Baugh, Daniel W., Jr.: *See*—
Harnden, Robert M.; and Baugh, Daniel W., Jr., 4,405,794, Cl. 548-229.000.

Baugh, Wesley A.: *See*—
Yang, Ling; Medico, Russell R.; and Baugh, Wesley A., 4,405,595, Cl. 423-600.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,405,574, Cl. 423-157.000.
Lee, John M.; and Bauman, William C., 4,405,576, Cl. 423-181.000.

Baur, Guenter; Greubel, Waldemar; Krueger, Hans; and Schauer, Alois, to Siemens Aktiengesellschaft. Display device for displaying light images on a dark background. 4,405,210, Cl. 350-345.000.

Baxter Travenol Laboratories, Inc.: *See*—
Mittleman, Herbert, 4,405,316, Cl. 604-86.000.

Bayer Aktiengesellschaft: *See*—
Fauss, Rudolf, 4,405,803, Cl. 556-410.000.
Freitag, Dieter; Reinking, Klaus; and Tacke, Peter, 4,405,554, Cl. 264-300.000.
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.
Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, 4,405,644, Cl. 424-322.000.
Kinast, Gunther; Schedel, Michael; and Koebernick, Wolfgang, 4,405,714, Cl. 435-84.000.
Maas, Joachim; Steinberger, Helmut; and Moretto, Hans-Heinrich, 4,405,490, Cl. 252-358.000.
Muller, Hanns P.; Wagner, Kuno; Mummenhoff, Peter; Wallpott, Gottfried; and Scheuss, Karlheinz, 4,405,751, Cl. 524-720.000.
Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, 4,405,742, Cl. 524-315.000.
Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahnler, Friedrich; and Brassat, Bert, 4,405,748, Cl. 524-504.000.
Recker, Klaus; Reinecke, Gerd; Awater, Albert; Grogler, Gerhard; and Kraft, Karl J., 4,405,752, Cl. 524-847.000.
Wegener, Gerhard; Knofel, Hartmut; Ellendt, Gunther; and Petinaux, Marcel, 4,405,527, Cl. 260-453.0PH.

Bayerle, Armin; Holz, Karl-Heinz; Luke, Johannes; and Riederer, Wolfgang, to Hoechst Aktiengesellschaft. Equipment and process for heating water by solar energy. 4,404,957, Cl. 126-419.000.

Bazell, Seymour: *See*—
Goldberg, Edward M.; and Bazell, Seymour, 4,404,924, Cl. 116-270.000.

BBC Brown, Boveri & Company Limited: *See*—
Albrecht, Joachim; Duerig, Thomas; and Weber, Walter, 4,405,387, Cl. 148-11.50R.
Brand, Andreas; and Datz, Rudolf, 4,404,929, Cl. 122-412.000.

Beale, William T., to Sunpower, Inc. Center-porting and bearing system for free-piston stirling engines. 4,404,802, Cl. 60-520.000.

Beard Industries, Inc.: *See*—
Noyes, Ronald T., 4,404,756, Cl. 34-65.000.

Beard, Walter C. Tilt valve structure with bridged stop for viscous flow liquids. 4,405,065, Cl. 222-153.000.

Beasley, Albert C.: *See*—
Beasley, Albert W.; and Beasley, Albert C., 4,404,814, Cl. 62-171.000.

Beasley, Albert W.; and Beasley, Albert C. Auxiliary condenser cooling tool for refrigerated air conditioners. 4,404,814, Cl. 62-171.000.

Beaussier, Michel; Lesch, Henry; and Evon, Emile, to Societe Internationale de Revetements de sol S.A. - S.I.R.S. Ground covering with drainage-promoting members. 4,405,665, Cl. 428-17.000.

Beecham Group Limited: *See*—
Buckle, Derek R.; and Smith, Harry, 4,405,620, Cl. 424-250.000.
Dickinson nee Berryman, Kay H.; Smale, Terence C.; and Southgate, Robert, 4,405,637, Cl. 424-274.000.

Beecham Inc.: *See*—
Pritchard, Robert W.; Drozd, Edward J.; and Lutz, Michael K., 4,405,306, Cl. 604-87.000.

Beever, William H.; and Brady, Donnie G., to Phillips Petroleum Company. Treatment of poly(arylene sulfide). 4,405,767, Cl. 525-537.000.

Beghin-Say, S.A.: *See*—
Monsan, Pierre, 4,405,715, Cl. 435-105.000.

Behr, Hans: *See*—
Vetter, Kurt, 4,405,086, Cl. 239-224.000.

Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.

Behringwerke Aktiengesellschaft: *See*—
Kohl, Helmut, 4,405,721, Cl. 436-128.000.
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Wormsbacher, Wilfried, 4,405,603, Cl. 424-101.000.

Beier, Rudolf: *See*—
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,405,032, Cl. 180-259.000.

Beijbom, Peter: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,405,037, Cl. 188-196.00D.

Beilfuss, Wolfgang: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 549-417.000.

Bejczy, Antal K., to United States of America, National Aeronautics and Space Administration. Optical fiber tactile sensor. 4,405,197, Cl. 350-96.150.

Bell, Albert H., III; and Hyde, James C., to General Motors Corporation. Gas turbine prechamber and fuel manifold structure. 4,404,806, Cl. 60-737.000.

Bell, Frank H.; and Peterson, John A., to Thiokol Corporation. Self-sparging inertia armed nose fuze. 4,404,911, Cl. 102-221.000.

Bell, Lon E., to Technar Incorporated. Heated diesel fuel filter. 4,404,949, Cl. 123-557.000.

Bell, Ronald D.: *See*—
McGill, Eugene C.; and Bell, Ronald D., 4,405,587, Cl. 423-235.000.

Bell Telephone Laboratories, Incorporated: *See*—
Grau, Thomas G., 4,405,233, Cl. 356-237.000.
Perez-Mendez, Pedro I., 4,405,983, Cl. 364-200.000.
Zebo, Timothy J., 4,405,840, Cl. 179-170.200.

Bellmann, Manfred: *See*—
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.

Beloit Corporation: *See*—
Alheid, Robert J., 4,405,661, Cl. 427-356.000.
Frye, Kenneth G.; Grody, Donald R.; and Guild, Gerald A., 4,405,126, Cl. 271-279.000.
Powell, John E.; and Powell, Andrian J. C., 4,405,265, Cl. 406-109.000.

Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A. Apparatus for refining molten metals from insoluble impurities. 4,405,118, Cl. 266-227.000.

Belttary, Harold E., to GTE Products Corporation. Arc chamber channel. 4,405,846, Cl. 200-144.00R.

Bendix Corporation, The: *See*—
Aron, Mitchell; and Sosinsky, Emanuel, 4,405,939, Cl. 358-65.000.
Ide, John D.; Settlemire, David J.; and Novo, Mario C., 4,406,019, Cl. 455-245.000.
Walter, Richard P.; and Muller, Robert D., 4,405,082, Cl. 239-91.000.

Bennett, Robert C. Survey data collecting system. 4,405,157, Cl. 283-58.000.

Bensberg, Wolfgang; and Klapp, Hartmut, to Jagenberg-Werke AG. Adjustable carton folding machine. 4,405,304, Cl. 493-476.000.

Bentley, Rick J.: *See*—
Turnquist, Edwin W.; and Bentley, Rick J., 4,404,891, Cl. 91-45.000.

Bergandy, Wieslaw, to National Instrument Co., Inc. Filling machine. 4,405,061, Cl. 222-21.000.

Berger, Ronald: *See*—
Lubowsky, Jack; and Berger, Ronald, 4,405,300, Cl. 432-2.000.

Bergman, Hans I.; and Nyman, Bjorn D., to Saab-Scania Aktiebolag. Arrangement for limiting uncontrolled articulation movements at the picot between vehicle units in articulated vehicles, preferably articulated buses. 4,405,145, Cl. 280-432.000.

Bergman, Werner. Electric filter with movable belt electrode. 4,405,342, Cl. 55-6.000.

Bergmann, Eduard: *See*—
Kinzl, Marwin; and Bergmann, Eduard, 4,404,939, Cl. 123-333.000.

Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, to BASF Aktiengesellschaft. Navy disperse dye mixtures. 4,405,330, Cl. 8-639.000.

Bergvall, Goran A.: *See*—
Manson, Mans O.; Sjogreen, Carl-Axel E.; and Bergvall, Goran A., 4,405,471, Cl. 252-34.000.

Bernard, David L.; Backus, John K.; and Doheny, Anthony J., Jr., to Mobay Chemical Corporation. Foamed polyisocyanurates. 4,405,725, Cl. 521-112.000.

Berrill, William H.; and Price, Frank C., to USM Corporation. Machine for lasting side portions of shoes. 4,404,700, Cl. 12-12.000.

Berthold, Rudiger; and Muller, Werner H., to Hoechst Aktiengesellschaft. Process for the preparation of 3,5-dimethylaniline. 4,405,813, Cl. 564-415.000.

Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., to Standard Oil Company (Indiana). Process for removing sulfur oxides from a gas. 4,405,443, Cl. 208-113.000.

Bertram, James L.; Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Phosphonium bicarbonate catalysts for promoting reaction of epoxides with carboxylic acids or anhydrides. 4,405,766, Cl. 525-507.000.

Besic, Frank C., to University Patents, Inc. Methods and materials for prevention of carious degradation of teeth. 4,405,600, Cl. 424-57.000.

Best, Michael J. A., to Smith International, Inc. Underwater Christmas tree cap and lockdown apparatus. 4,405,016, Cl. 166-337.000.

Bezman, Susan A., to Chevron Research Company. Diisopropyl ether hydration in isopropanol production. 4,405,822, Cl. 568-899.000.

Bhagwat, Pradeep M.; and Stefanovic, Victor R., to Canadian Patents and Dev. Limited. Commutation circuits for thyristor inverters. 4,405,977, Cl. 363-124.000.

Bickel, Hans: *See*—
Scartazzini, Riccardo; and Bickel, Hans, 4,405,778, Cl. 544-16.000.

Bierhenke, Hartwig; Birkle, Siegfried; and Rubner, Roland, to Siemens Aktiengesellschaft. Method of producing relief structures for integrated semiconductor circuits. 4,405,707, Cl. 430-281.000.

Biller, Horst: *See*—
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.

Binder, Volker; Merk, Wolfgang; and Werle, Peter, to Degussa Aktiengesellschaft; and Degussa Aktiengesellschaft. Process for the production of dihydroxypropyltheophylline. 4,405,783, Cl. 544-267.000.

Bingel, Carl J.: *See*—
Demianczuk, Dionisyj W.; and Bingel, Carl J., 4,405,381, Cl. 148-2.000.

Binsack, Rudolf: *See*—
Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahnler, Friedrich; and Brassat, Bert, 4,405,748, Cl. 524-504.000.

Bione, Angelo A., to Marmon Group, Inc., The. Integrated harmony generating circuit for electronic organ. 4,404,883, Cl. 84-1.030.

BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,405,309, Cl. 604-317.000.

Birecki, Henryk: *See*—
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., Jr., 4,405,993, Cl. 365-108.000.

Birkle, Siegfried: *See*—
Bierhenke, Hartwig; Birkle, Siegfried; and Rubner, Roland, 4,405,707, Cl. 430-281.000.

Bixby, Willard W., Jr.; and Christopher, Jerry, to Haskel, Incorporated. Pneumatically controlled rate pump. 4,405,292, Cl. 417-403.000.

Blachford, John, to H. L. Blachford Ltd/Ltee. Method of drawing a metal wire and lubricant composition therefor. 4,404,828, Cl. 72-42.000.

Blackburn, Tom L., to GTE Automatic Electric Incorporated. Variolosser for an automatic gain control circuit. 4,405,903, Cl. 330-284.000.

Blain, William A., to Nabisco Brands, Inc. Masa sheeting apparatus. 4,405,298, Cl. 425-308.000.

Blair, Bruce A. Portable roll-riding tape cutter. 4,405,068, Cl. 225-65.000.

Blair, Donald G.: *See*—
Vande Woude, George F.; McClements, William L.; Oskarsson, Marianne K.; and Blair, Donald G., 4,405,712, Cl. 435-5.000.

Blake, Edward W.: *See*—
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,404,837, Cl. 72-349.000.

Blanchard, Bradley V.: *See*—
Blanchard, Vernon F.; and Blanchard, Bradley V., 4,404,878, Cl. 82-2.500.

Blanchard, Vernon F.; and Blanchard, Bradley V. Bar stock feed apparatus. 4,404,878, Cl. 82-2.500.

Blaschek, Otto, to Arnold & Richter Cinetechnik GmbH, & Co. Betriebs KG. Film transport mechanism. 4,405,070, Cl. 226-55.000.

Blau, Jonathan S.; and Rosen, Josh, to Data General Corporation. Arithmetic unit for use in data processing systems. 4,405,992, Cl. 364-748.000.

Blaustein, Eric W.; and Patton, Edward J., to Acres American Incorporated. Refuse derived fuel and a process for the production thereof. 4,405,331, Cl. 44-1.00D.

Blechinger, Chester J., to Ford Motor Company. Velocity and mass air flow sensor. 4,404,858, Cl. 73-861.020.

Block, Robert S.; and Martin, John R., to Telease, Inc. Method and system for secure transmission and reception of video information, particularly for television. 4,405,942, Cl. 358-119.000.

Blom, Fritz, to Windmoller & Holscher. Apparatus for oxygenating an extruded molten polyethylene film. 4,405,404, Cl. 156-497.000.

Blomsterberg, Karl-Imgemar. Method of anodically deburring articles of copper or copper alloy. 4,405,422, Cl. 204-129.850.

Bloombaum, Barry D.: *See*—
Barnard, John; and Bloombaum, Barry D., 4,405,551, Cl. 264-245.000.

Bloss, Karl H.; and Stewart, Royann L., to PPG Industries, Inc. Method of melting glass on molten metal alloys. 4,405,352, Cl. 65-99.400.

Blot, Michel: *See*—
Saint-Sevin, Michel; Blot, Michel; and Moirez, Jacques, 4,405,204, Cl. 350-174.000.

Blumentritt, Bruce F.; and Shyan Shen, John C., to International Business Machines Corporation. Rigid magnetic coating composition with thermosetting binder for hard file. 4,405,684, Cl. 428-336.000.

Blythin, David; and Green, Michael J., to Schering Corporation. 7-Aryl-hept-5-ynoic acids and derivatives thereof. 4,405,810, Cl. 562-495.000.

Board of Regents, University of Texas System: *See*—
Weldon, William F.; and Woodson, Herbert H., 4,405,965, Cl. 361-43.000.

Boden, Richard M., to International Flavors & Fragrances Inc. 1-Ethoxy-1-ethanol acetate-acetaldehyde mixtures and uses thereof for augmenting or enhancing the aroma or taste of consumable materials. 4,405,510, Cl. 252-522.00R.

Boden, Richard M.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Use of cycle carbonate in augmenting or enhancing the aroma or taste of foodstuffs and chewing gums. 4,405,646, Cl. 426-3.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Branched chain olefinic alcohols, thiols, esters and ethers, organoleptic uses thereof, processes for preparing same and intermediates therefor. 4,405,820, Cl. 568-840.000.

Boehmer, Georg: *See*—
Vorbach, Gunther; and Boehmer, Georg, 4,405,957, Cl. 360-99.000.

Boen, Laurence K.: *See*—
Lamberti, Vincent; and Boen, Laurence K., 4,405,526, Cl. 260-400.000.

Boettcher, Alfred, to Boettcher, Alfred. Solar energy collector, and water heater and heating device with a heat pump containing the said collector. 4,404,958, Cl. 126-426.000.

Bohannon, William D., Jr., to Western Electric Company, Inc. Apparatus for forming a metallic tape into a tube having an overlapped seam. 4,404,720, Cl. 29-33.00E.

Bolen, Ralph A., to Sawyer, John. Apparatus for activating system in response to impact. 4,405,099, Cl. 244-1.00R.

Bolle, Maurice, to Etablissements Bolle Georges, Robert et Maurice. Safety glasses. 4,405,214, Cl. 351-88.000.

Bond, Thomas J.: *See*—
Koch, Paul E.; Bond, Thomas J.; and Adams, Richard C., 4,405,547, Cl. 264-171.000.

Bononi, Walter. Process for decorating spectacle frames. 4,405,852, Cl. 219-121.0LJ.

Book Covers, Inc.: *See*—
Carter, Leewood C.; and Neary, Robin P., 4,405,156, Cl. 281-29.000.

Borgarello, Enrico: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Borgarello, Enrico; and Pelizzetti, Ezio, 4,405,424, Cl. 204-157.10R.

Borgman, Robert J.: *See*—
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,405,642, Cl. 424-309.000.

Borrelli, Nicholas F.: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Tick, Paul A.; and Trotter, Donald M., 4,405,672, Cl. 428-68.000.

Boucher, Armand R., to Joseph E. Seagram & Sons, Inc. Preparation of wine having a low calorie content and a reduced alcohol content. 4,405,652, Cl. 426-494.000.

Boudreau, Robert J.; and Cunard, Joel C., to Brown Group Recreational Products, Inc. Universal velocipede wheel. 4,405,179, Cl. 301-2.500.

Bouilun, John: *See*—
Kolchinsky, Abel E.; Bouilun, John; and Davis, Wayne, 4,405,251, Cl. 403-9.000.

Bowen, James B.; and Kramer, Charles F., to Steel Heddle Manufacturing Co. Heddle frame assembly construction and method. 4,404,995, Cl. 139-92.000.

Boyadjieff, George I., to Varco International, Inc. Gripping jack system. 4,405,115, Cl. 254-106.000.

Brady, Donnie G.: *See*—
Beever, William H.; and Brady, Donnie G., 4,405,767, Cl. 525-537.000.

Brady, Sam A.; and Elias, Michael G., to Dow Corning Corporation. Method of providing earth covering useful for water harvesting. 4,405,264, Cl. 405-270.000.

Brand, Andreas; and Datz, Rudolf, to BBC Brown Boveri & Company Limited. Liquid distributor head actuated by fluid pressure. 4,404,929, Cl. 122-412.000.

Brandenburg, Helmut, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Cutter bit for a mining machine. 4,405,178, Cl. 299-81.000.

Brandewie, Joseph E.; and Hart, Granville S., to AMP Incorporated. Electrical harness fabrication using improved wire measuring method. 4,404,743, Cl. 29-857.000.

Brant, Gordon W., to Redlake Corporation. Film speed control systems for high speed motion picture cameras. 4,405,217, Cl. 352-84.000.

Brassat, Bert: *See*—
Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahnler, Friedrich; and Brassat, Bert, 4,405,748, Cl. 524-504.000.

Braun, Howard R.: *See*—
Johnson, Arthur W.; and Braun, Howard R., 4,404,809, Cl. 62-49.000.

Braun, Martin: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,404,831, Cl. 72-148.000.

Braun, Morris; and Wavering, Karen A., to W. Braun Co. Container including pressure mounted inner cover. 4,405,054, Cl. 215-277.000.

Breese, Maurice E.; and Robinson, Arthur S., to RCA Corporation. Controllable phase shifter comprising gyromagnetic and non-gyromagnetic sections. 4,405,907, Cl. 333-24.100.

Breuer, Uwe: *See*—
Hultsch, Gunther; Alstetter, Franz; and Breuer, Uwe, 4,405,454, Cl. 209-279.000.

Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, to Thomson-Brandt. Thermosensitive data-carrier designed for the recording of information and a method of recording information on such a data-carrier. 4,405,862, Cl. 250-318.000.

Bridgeport Metal Goods Manufacturing Company, The: *See*—
Vanas, Martin M., 4,404,977, Cl. 132-88.700.

Bridigum, Robert J.; and Johnston, William S., to American Standard Inc. Cap nut for a trip cock device including a detent arrangement for overriding automatic reset. 4,404,987, Cl. 137-556.000.

Brill-Edwards, Kenneth O. P., to Crescent Roofing Company Ltd. Method of making static solar heat collectors. 4,405,396, Cl. 156-155.000.

Brill, Garrett W. Keeper device for door lock. 4,404,826, Cl. 70-416.000.

Brinkmann, Hans: *See*—
Schulte, Herbert; Brinkmann, Hans; and Sommermeyer, Uwe, 4,405,539, Cl. 264-77.000.

Brison, Marc P., to Moulinex, Societe Anonyme. Domestic mixer. 4,405,998, Cl. 366-264.000.

Bristol Babcock Inc.: *See*—
Doron, Joseph, 4,406,014, Cl. 377-107.000.

British Petroleum Company Limited, The: *See*—
Barclay, John L.; Hargrove, John D.; and Prince, Richard J., 4,405,503, Cl. 252-455.00Z.
Pippard, David A., 4,405,493, Cl. 252-389.00A.

Broadbent, George T., to Automotive Products Limited. Clutch release mechanism for a pull type clutch. 4,405,041, Cl. 192-98.000.

Brooker, Lenon G.; and Mungin, Halbert, to Westinghouse Electric Corp. Polyethylene glycol modified melamine aldehyde resin and postformable laminate made therewith. 4,405,690, Cl. 428-503.000.

Brown, Boveri & Cie AG: *See*—
Fischer, Wilfried; and Hasenauer, Dieter, 4,405,696, Cl. 429-104.000.

Brown Boveri Kent Limited: *See*—
Wass, Colin, 4,404,861, Cl. 73-861.830.

Brown Group Recreational Products, Inc.: *See*—
Boudreau, Robert J.; and Cunard, Joel C., 4,405,179, Cl. 301-2.500.

Brown, Kenneth, to Fisons, Limited. Composition for treating asthma. 4,405,598, Cl. 424-45.000.

Brown, Richard E.; Loev, Bernard; and St. Georgiev, Vassil, to USV Pharmaceutical Corporation. Method of treatment of asthma. 4,405,633, Cl. 424-272.000.

Brown, Ronald L.: *See*—
Wolniak, Stanley C.; Spencer, Elbert M.; and Brown, Ronald L., 4,405,843, Cl. 200-44.000.

Brownscombe, Thomas F., to Shell Oil Company. Reinforced polymer compositions and their preparation. 4,405,727, Cl. 523-205.000.

Brownscombe, Thomas F.: *See*—
Wong, Pui K.; Willis, Carl L.; and Brownscombe, Thomas F., 4,405,772, Cl. 526-308.000.

Brunnee, Curt; Delgmann, Lothar; and Marten, Gunter, to Finnigan Mat GmbH. Automatically controllable loading apparatus for mass spectrometers or the like. 4,405,860, Cl. 250-288.000.

Brunswick Corporation: *See*—
Staerzl, Richard E., 4,405,892, Cl. 322-89.000.

BS&B Safety Systems, Ltd.: *See*—
Ou, Sam A., 4,404,982, Cl. 137-68.00R.

Buckle, Derek R.; and Smith, Harry, to Beecham Group Limited. Piperazine derivatives. 4,405,620, Cl. 424-250.000.

Bucklers, Lothar: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 549-417.000.

Budoff, Penny W. Douche delivery device. 4,405,321, Cl. 604-212.000.

Buhse, Ulf; and Schwarz, Henning, to U.S. Philips Corporation. Circuit for receiving two-tone/stereophonic programs. 4,405,834, Cl. 179-1.0GB.

Buning, Onno; and Lawes, Peter, to Howmedica International Inc. Modular prosthesis assembly. 4,404,691, Cl. 3-1.911.

Burghart, George L. Dynamically balanced vibratory system. 4,405,043, Cl. 198-769.000.

Burkner, Wolfgang; and Melzer, Gerhard, to Carl Schenck AG. Unloading rack with elevating device for a heat press. 4,405,277, Cl. 414-222.000.

Burlington Industries, Inc.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; Reeder, Kevin J.; and Hontz, Thomas D., 4,404,698, Cl. 5-507.000.

Burmeister, Robert A., Jr.: *See*—
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., Jr., 4,405,993, Cl. 365-108.000.

Burns, Thomas J. Gamma thermometer based reactor core liquid level detector. 4,406,011, Cl. 376-247.000.

Burr, Bruce H.; and Marshek, Kurt M. Device for evaluating abrasive wear of elastomeric O-ring materials. 4,404,840, Cl. 73-7.000.

Burroughs Corporation: *See*—
Fiorentino, Ermenegildo; Wojtowicz, Edward A.; and Leadlie, Robert J., 4,405,972, Cl. 361-417.000.

Burroughs Wellcome Co.: *See*—
Thorogood, Peter B., 4,405,634, Cl. 424-273.00R.

Busca, Giovanni; and Johnson, Leland, to Oscilloquartz S.A. Atomic frequency standard having microwave loop around absorption cell. 4,405,905, Cl. 331-94.100.

Buschbom, Floyd E.; and Henke, Donald L., to Veda, Inc. Releasable drive apparatus. 4,405,040, Cl. 192-67.00R.

Bushey, Dean F.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Novel derivatives of bicyclic 2-aminothiazolidine oximes. 4,405,632, Cl. 424-270.000.

Busse, Oswald; and Klesper, Hugo, to Passavant-Werke AG & Co. KG. Plate-type filter press with a cleaning truck. 4,405,457, Cl. 210-225.000.

Butz, Hans, to Fichtel & Sachs AG. Wheel hub for two-wheeled vehicles. 4,405,180, Cl. 301-111.000.

Buurma, Gerald B.; and Jorgensen, John M., to National Semiconductor Corporation. CMOS Reset circuit. 4,405,871, Cl. 307-594.000.

Byrd, Norman R., to McDonnell Douglas Corporation. Electrodeposition of coatings on metals to enhance adhesive bonding. 4,405,427, Cl. 204-181.00R.

C. A. Weidmuller K.G.: *See*—
Stenz, Paul; and Wilmes, Manfred, 4,404,744, Cl. 29-883.000.

Caballero, Alejandro J.; and Holcombe, Ricardo I., to Materias Primas, Monterrey, S.A. Process of removing iron impurities from ores. 4,405,588, Cl. 423-340.000.

Calfee, Richard V.: *See*—
Gordon, Pat L.; Calfee, Richard V.; and Miner, Jay, 4,404,972, Cl. 128-419.0PG.

Calhoun, L. Owen; and Murray, Michael A., to CTS Corporation. Trenchduct construction having adjustable lid-supporting means. 4,404,779, Cl. 52-126.200.

California Institute of Technology: *See*—
Rowlette, John J., 4,405,697, Cl. 429-161.000.

Camp, Howard C. Automatic-locking toilet seat lid. 4,404,695, Cl. 4-253.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Johnson, Arthur W.; and Braun, Howard R., 4,404,809, Cl. 62-49.000.

Canadian Patents and Dev. Limited: *See*—
Bhagwat, Pradeep M.; and Stefanovic, Victor R., 4,405,977, Cl. 363-124.000.

Canalizo, Carlos R., to Otis Engineering Corporation. Downhole double acting pump. 4,405,291, Cl. 417-393.000.

Cancer Research Center: *See*—
McEntire, John E.; and Papermaster, Ben W., 4,405,601, Cl. 424-95.000.

Candor, James T. Electrostatic method for treating material. 4,404,754, Cl. 34-1.000.

Cannella, Vincent D.: *See*—
McCormick-Goodhart, Mark H.; Cannella, Vincent D.; and Minko, Robert, 4,404,926, Cl. 118-641.000.

Canon Kabushiki Kaisha: *See*—
Hirai, Yutaka; Hatanaka, Katsunori; Ayata, Naoki; and Uzawa, Shunichi, 4,405,857, Cl. 250-211.00J.
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.
Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, 4,405,915, Cl. 338-15.000.
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,405,656, Cl. 427-39.000.
Shirai, Shigeru; Kanbe, Junichiro; and Ohno, Shigeru, 4,405,702, Cl. 430-60.000.
Yamamoto, Hiroshi; Uchidoi, Masanori; and Kawamura, Masaharu, 4,405,222, Cl. 354-238.000.

Capitanio, Lorenzo: *See*—
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,405,505, Cl. 252-461.000.

Capshew, Charles E.; Short, James N.; Welch, M. Bruce; and Dietz, Richard E. Catalyst, method of producing the catalyst, and polymerization process employing the catalyst. 4,405,769, Cl. 526-119.000.

Cardarelli, Nathan F., to Environmental Chemicals, Inc. Controlled release of herbicide compounds utilizing a thermoplastic matrix. 4,405,360, Cl. 71-117.000.

Cardinaux, Francois; Huguenin, Rene; and Pless, Janos, to Sandoz Ltd. Novel pentapeptides, processes for their production, pharmaceutical compositions comprising said pentapeptides and their use. 4,405,607, Cl. 424-177.000.

Carl Schenck AG: *See*—
Burkner, Wolfgang; and Melzer, Gerhard, 4,405,277, Cl. 414-222.000.

Carl Zeiss-Stiftung: *See*—
Rossmann, Dieter, 4,405,205, Cl. 350-255.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Sisti, Giorgio; Trestianu, Sorin; and Riva, Ermete, 4,405,344, Cl. 55-67.000.

Carloni, Massimo: *See*—
Cavazza, Claudio; Carloni, Massimo; and Ramacci, Maria T., 4,405,638, Cl. 424-275.000.

Carlson, Raymond G.; and Stone, Robert A., to United Technologies Corp. Vibration isolation system. 4,405,101, Cl. 244-17.270.

Caron, Peter L. Ampoule opener. 4,405,067, Cl. 225-93.000.

Carpets International-Georgia (Sales), Inc.: *See*—
Kyle, Joseph H., 4,405,674, Cl. 428-96.000.

Carr, William F.; and Chen, James M., to Engelhard Corporation. Ozone abatement catalyst having improved durability and low temperature performance. 4,405,507, Cl. 252-466.00B.

Carrier Corporation: *See*—
Gilson, John D., 4,404,815, Cl. 62-180.000.
Mount, Gordon L.; and Hesler, Benjamin F., 4,404,811, Cl. 62-84.000.
Zinsmeyer, Thomas M., 4,404,812, Cl. 62-84.000.

Carroll, W. Eamon; and Chan, Albert S., to Monsanto Company. Hydroformylation of formaldehyde with rhodium catalysts. 4,405,814, Cl. 568-462.000.

Carter, Jack D. Load bearing arrangement for a movable bucket fork lift attachment. 4,405,282, Cl. 414-724.000.

Carter, James H., II: *See*—
Crews, Harold R.; Carter, James H., II; and Sena, Ted, 4,405,719, Cl. 436-10.000.

Carter, Leewood C.; and Neary, Robin P., to Book Covers, Inc. Reinforced hinge for book cover. 4,405,156, Cl. 281-29.000.

Carter, Russell P., Jr., to Mobay Chemical Corporation. Polycarbonate-starch compositions. 4,405,731, Cl. 524-47.000.

Carter-Wallace, Inc.: *See*—
Sisbarro, Frederick P., 4,405,489, Cl. 252-315.400.

Cartwright, Clifford S., Jr. Practice arrow adapter simulating hunting arrow characteristics. 4,405,133, Cl. 273-419.000.

Casbeer, Jesse I., Jr. Rodent barrier for door over railroad track. 4,404,769, Cl. 49-58.000.

Case, Kirt L., to West Company, The. Syringe assembly. 4,405,317, Cl. 604-90.000.

Casey, Martin J.; and Sheppard, John E., to Sperry Corporation. Plasma etching process and apparatus. 4,405,406, Cl. 156-643.000.

Casio Computer Co., Ltd.: *See*—
Aihara, Toshiharu; Tahara, Iwao; Matsuo, Yushin; Takahashi, Naoki; Wakabayashi, Takuo, deceased; and Wakabayashi, Shigemasa, executor, 4,405,241, Cl. 368-63.000.

Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., to PPG Industries, Inc. Base solubilization of an azole-functional resin and electrodeposition of such solubilized resin. 4,405,428, Cl. 204-181.00R.

Catalano, Giordano. Planing form. 4,405,002, Cl. 144-2.00R.

Caterpillar Tractor Co.: *See*—
Larson, Larry A., 4,404,847, Cl. 73-119.00A.
Pickering, William; and Urbanc, David J., 4,405,990, Cl. 364-703.000.

Cavazza, Claudio; Carloni, Massimo; and Ramacci, Maria T., to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. 2-Methoxyphenyl esters of N-substituted amino acids, a process for their preparation and pharmaceutical compositions containing them. 4,405,638, Cl. 424-275.000.

Cave, Ellis K.; and Hazelwood, Neil, to TBS International, Inc. Telephone call progress tone and answer identification circuit. 4,405,833, Cl. 179-1.0MN.

Cavero, Leonardo P., to General Electric Company. System for providing protection for a high voltage transmission line. 4,405,966, Cl. 361-80.000.

Cefarelli, Frank P.; and Evans, Robert T., to International Business Machines Corp. Fiber optic connector. 4,405,201, Cl. 350-96.210.

Celamerck GmbH & Co., KG: *See*—
Itzel, Hanshelmut, 4,405,605, Cl. 424-173.000.

Celanese Corporation: *See*—
Hall, Henry K.; and Wilson, Donald R., 4,405,798, Cl. 549-363.000.
Lowery, James J.; Plotkin, Neil D.; and Robinson, Jack, 4,405,688, Cl. 428-398.000.

Censor Patent- und Versuchs-Anstalt: *See*—
Mayer, Herbert E., 4,405,229, Cl. 355-77.000.

Central Mine Equipment Company: *See*—
Rassieur, Charles L., 4,405,020, Cl. 173-89.000.

Centronics Data Computer Corp.: *See*—
Hanna, Samuel Y., 4,405,247, Cl. 400-196.100.

Cerami, Anthony; to Evreka, Inc. Method for arresting fulminating infection. 4,405,606, Cl. 424-177.000.

Cerberus AG: *See*—
Scheidweiler, Andreas, 4,405,919, Cl. 340-522.000.

Chabrolle, Jacques, to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques. Magnetic head for recording and reading magnetic data with variable track width. 4,405,959, Cl. 360-119.000.

Chai, Thomas Y., to Honeywell Inc. Matrix screening and grounding arrangement and method. 4,405,917, Cl. 340-365.00C.

Chakrabarti, Paritosh M.; Hashem, Mohamed M.; and Cheng, Tom M. H., to GAF Corporation. Treatment of effluents containing dioxane. 4,405,799, Cl. 549-369.000.

Chambers, Arthur D. Self aligning truck trailer. 4,405,144, Cl. 280-404.000.

Champion International Corporation: *See*—.
Dutcher, Daniel P.; and Roccaforte, Harry I., 4,405,078, Cl. 229-52.00B.
Roccaforte, Harry I., 4,405,066, Cl. 225-43.000.

Champseix, Alain A.; and Le Fur, Gerard R., to Pharmindustrie. 2 Phenyl-3-chloro-4[piperidyl alkyl]quinolines. 4,405,789, Cl. 546-176.000.

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Carroll, W. Eamon; and Chan, Albert S., 4,405,814, Cl. 568-462.000.

Chance, Leon H., to United States of America, Agriculture. Bromine-containing 2,4-diaminotriazines. 4,405,806, Cl. 560-43.000.

Chaney, David B.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; Reeder, Kevin J.; and Hontz, Thomas D., 4,404,698, Cl. 5-507.000.

Change, Jun H., to FMC Corporation. Herbicidal 3-isoxazolidinones and hydroxamic acids. 4,405,357, Cl. 71-88.000.

Chao, Li-Chung; and Scharf, Daniel J., to Occidental Chemical Corporation. Flame retardant polyamide compositions. 4,405,732, Cl. 524-83.000.

Charlebois, Leonard J.; and Huszarik, Fred A., to Northern Telecom Limited. Moulding apparatus for encapsulating cable splices. 4,405,083, Cl. 249-97.000.

Charman, David H.; Turner, Clara; and Turner, Henry W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Panel breaking apparatus. 4,405,104, Cl. 244-122.0AF.

Chasteen, Jack W., to University of Dayton. Method for cleaning metal parts. 4,405,379, Cl. 134-2.000.

Chatterji, Dulal C.; and Gallelli, Joseph F., to United States of America, Health and Human Services. Bisulfite stabilization of 5-azacytidine. 4,405,611, Cl. 424-180.000.

Chaudoir, Roderick J., to Hatco Corporation. Toaster with product warmer. 4,404,898, Cl. 99-331.000.

Chemie Linz Aktiengesellschaft: *See*—
Greinecker, Herbert; and Stern, Gerhard, 4,405,744, Cl. 524-423.000.

Chemische Fabrik Kreussler & Co. GmbH: *See*—
Hasenclever, Kaspar D., 4,405,511, Cl. 252-547.000.

Chen, James M.: *See*—
Carr, William F.; and Chen, James M., 4,405,507, Cl. 252-466.00B.

Chen, Thomas Y. C. Methods and apparatus for transferring liquid against high pressure resistance. 4,404,930, Cl. 122-451.00R.

Chen, Tu, to Xerox Corporation. Post treatment of perpendicular magnetic recording media. 4,405,677, Cl. 428-172.000.

Cheng, Tom M. H.: *See*—
Chakrabarti, Paritosh M.; Hashem, Mohamed M.; and Cheng, Tom M. H., 4,405,799, Cl. 549-369.000.

Cherill, Robert J.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,405,631, Cl. 424-267.000.

Cherot, Harrison, to Abbott Laboratories. Tamperproof closure system for plastic containers. 4,405,053, Cl. 215-32.000.

Cherry, Hitesh; Mueller, Arthur L.; and Werner, Walter M., to AMP Incorporated. Pin and socket connector. 4,405,195, Cl. 339-252.00R.

Chevron Research Center: *See*—
Pyle, Walter R., 4,405,594, Cl. 423-579.000.

Chevron Research Company: *See*—
Bezman, Susan A., 4,405,822, Cl. 568-899.000.
Singer, Malcolm S., 4,405,355, Cl. 71-86.000.
Vaughan, Ronald J., 4,405,420, Cl. 204-105.00M.

Chiang, Yunn H.: *See*—
Bader, Henry; and Chiang, Yunn H., 4,405,781, Cl. 544-264.000.

Chiba, Jiro: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.

Chicago Bridge & Iron Company: *See*—
Mukherjee, Shib P., 4,405,349, Cl. 62-532.000.
Trammell, Joel H., 4,404,988, Cl. 137-565.000.

Childs, Geoffrey H. L.: *See*—
Foster, Robert A. L.; and Childs, Geoffrey H. L., 4,405,830, Cl. 178-30.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Angyan, Sandor; Racz, Istvan; Radvanyi, Erzsebet; Kovats, Ferenc; Detre, Tamas; and Sos, Jozsef, 4,405,353, Cl. 11-3.000.

Chisso Corporation: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; and Tsuji, Masakazu, 4,405,488, Cl. 252-299.630.

Chosakon, Yoshinori: *See*—
Nakajima, Kazuhisa; Miyashita, Masahiko; Hakozaki, Susumu; and Chosakon, Yoshinori, 4,405,808, Cl. 560-247.000.

Chow, William W.; Fields, Davis S., Jr.; Hu, Paul Y.; and Lopez, Jorge L., to International Business Machines. Thermoelectric cooling of magnetic head assemblies. 4,405,961, Cl. 360-129.000.

Choy, William: *See*—
Masamune, Satoru; and Choy, William, 4,405,802, Cl. 556-402.000.

Christ, Alfred; and Miesch, Johann, to Escher Wyss Limited. Hydrostatic support element, especially for a controlled deflection roll. 4,404,724, Cl. 29-116.0AD.

Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., to American Can Company. Retortable packaging structure. 4,405,667, Cl. 428-35.000.

Christopher, Jerry: *See*—
Bixby, Willard W., Jr.; and Christopher, Jerry, 4,405,292, Cl. 417-403.000.

Chudy, John S.: *See*—
Shoji, Robert M.; Chudy, John S.; and Eberly, Carlyle J., 4,406,000, Cl. 369-44.000.

Chung, Chan I.; and Barr, Robert A. Energy efficient extruder screw. 4,405,239, Cl. 366-89.000.

Ciba-Geigy Corporation: *See*—
Abel, Heinz; and Hugelshofer, Paul, 4,405,329, Cl. 8-527.000.
Scartazzini, Riccardo; and Bickel, Hans, 4,405,778, Cl. 544-16.000.

Cieciuch, Ronald F.: *See*—
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,405,788, Cl. 546-165.000.

Cieloszyk, Gary S.: *See*—
Lee, Kiu H.; and Cieloszyk, Gary S., 4,405,495, Cl. 252-429.00B.

Claassen, Peter: *See*—
Krempl, Peter; Zeiringer, Rudolf; and Claassen, Peter, 4,404,854, Cl. 73-730.000.

Clark, Floyd R.: *See*—
Sherman, William P.; Clark, Floyd R.; and Will, Lothar K., 4,404,955, Cl. 126-121.000.

Claudius Peters, Inc.: *See*—
Laidlaw, Walter, 4,405,240, Cl. 366-101.000.

Clayman, John M.; and Weiner, Norman, to P. Clayman & Sons, Inc. Shanked innersole construction. 4,404,702, Cl. 12-146.00S.

Clingman, John W.: *See*—
Kinzer, Jay; and Clingman, John W., 4,405,456, Cl. 210-195.400.

Cloostermans-Huwaert, Leo, to Societe Franco-Belge des Laminoirs et Trefileries d'Anvers "Lamitrefil". Process of treatment of a precipitation hardenable Al-Mg-Si-alloy. 4,405,385, Cl. 148-11.50A.

Clough, Douglas O.: *See*—
Parker, Alan; and Clough, Douglas O., 4,404,792, Cl. 57-401.000.

Clyburn, C. Wayne, to Hamilton Stands, Incorporated. Clamp system for telescoping tubes. 4,405,107, Cl. 248-122.000.

Cobb, Arnold J., to Fiber Industries, Inc. Process for filtering molten polymer. 4,405,548, Cl. 264-176.00F.

Cochran, Gary L.; Dawson, James E.; and Stromberg, Gary D., to J. I. Case Company. Modular loader frame structure. 4,405,280, Cl. 414-685.000.

Coffinberry, George A., to United States of America, National Aeronautics and Space Administration. Apparatus for improving the fuel efficiency of a gas turbine engine. 4,404,793, Cl. 60-39.070.

Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Laminating process. 4,405,394, Cl. 156-83.000.

Cohen, Arnold, to Reichhold Chemicals, Incorporated. Polyvinyl chloride shoe sole composition. 4,405,730, Cl. 524-35.000.

Coker, William R.: *See*—
Wydro, Jan J.; Scholl, Charles H.; and Coker, William R., 4,405,063, Cl. 222-146.0HE.

Colgate-Palmolive Company: *See*—
Gibbons, Edward J., 4,405,399, Cl. 156-243.000.
Karami, Hamzeh, 4,405,310, Cl. 604-383.000.

Collins & Aikman Corporation: *See*—
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,703, Cl. 15-230.110.
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,999, Cl. 139-391.000.

Collins, Walter W., to Schur, Inc. Knife and sheath assembly. 4,404,747, Cl. 30-151.000.

Colt Industries Operating Corp.: *See*—
Zechlin, Richard; and Henderson, Robert M., 4,404,951, Cl. 123-595.000.

Comandini, Ettore: *See*—
Zardi, Umberto; and Comandini, Ettore, 4,405,562, Cl. 422-148.000.

Combustion Engineering, Inc.: *See*—
Roddy, Robert L., 4,405,075, Cl. 228-49.00B.

Commissariat a l'Energie Atomique: *See*—
Forster, Michel; Jaouen, Adrien; Jorda, Alain; and Rampin, Pierre, 4,405,988, Cl. 364-502.000.

Conoco Inc.: *See*—
Duckwall, Louis R., Jr., 4,405,819, Cl. 568-814.000.

Consiglio Nazional delle Ricerche: *See*—
Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, 4,405,695, Cl. 429-103.000.

Consortium fur Elektrochemische Ind. GmbH: *See*—
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Contraves AG: *See*—
Wermelinger, Hans, 4,405,842, Cl. 200-17.00R.

Cook Incorporated: *See*—
Cope, Constantin, 4,405,314, Cl. 604-51.000.

Cooper, Leonard B. Spectacle frame and conversion accessories therefor. 4,405,212, Cl. 351-43.000.

Cooper, Martin H.: *See*—
Mangus, James D.; and Cooper, Martin H., 4,405,558, Cl. 376-233.000.

Cooperativa Agricola de Productie Scornicesti: *See*—
Ilies, Nicolae, 4,405,602, Cl. 424-95.000.

Cope, Constantin, to Cook Incorporated. Apparatus and method for catheterization permitting use of a smaller gage needle. 4,405,314, Cl. 604-51.000.

Cornelius, Edward B.: *See*—
Kovach, Stephen M.; and Cornelius, Edward B., 4,405,445, Cl. 208-120.000.

Cornell Research Foundation, Inc.: *See*—
Balasubramanyam, Karanam; and Rueff, Arthur L., 4,405,710, Cl. 430-311.000.

Cornet, Jean; Lehureau, Jean-Claude; and Magna, Henriette, to Thomson-CSF. Thermo-optic information writing process and information support for implementing this process. 4,405,994, Cl. 365-126.000.

Corning Glass Works: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Tick, Paul A.; and Trotter, Donald M., 4,405,672, Cl. 428-68.000.
Tick, Paul A., 4,405,724, Cl. 501-44.000.

Cosentino, Louis C., to Renal Systems, Inc. Porous titanium coating for blood access device. 4,405,319, Cl. 604-175.000.

Cosentino, Louis C.: *See*—
Cracauer, Raymond F.; Fuller, Larry E.; Martinez, Felix J.; and Cosentino, Louis C., 4,405,320, Cl. 604-175.000.

Costa, Bruno: *See*—
Arno', Mario; and Costa, Bruno, 4,405,364, Cl. 75-52.000.

Coulter Electronics, Inc.: *See*—
Crews, Harold R.; Carter, James H., II; and Sena, Ted, 4,405,719, Cl. 436-10.000.

Coutts, Maurice D.; and Matthies, Dennis L., to RCA Corporation. Video disc processing. 4,405,541, Cl. 264-107.000.

Couture, Fernand: *See*—
Allard, Rene; Couture, Fernand; and Couture, Raynald, 4,405,169, Cl. 296-3.000.

Couture, Raynald: *See*—
Allard, Rene; Couture, Fernand; and Couture, Raynald, 4,405,169, Cl. 296-3.000.

Cowan, Robert L., II: *See*—
Gordon, Gerald M.; Cowan, Robert L., II; and Davies, John H., 4,406,012, Cl. 376-414.000.

Cox, Herman G., III. Satellite ice plant. 4,404,817, Cl. 62-320.000.

CPC International Inc.: *See*—
Urbas, Branko, 4,405,717, Cl. 435-140.000.

Cracauer, Raymond F.; Fuller, Larry E.; Martinez, Felix J.; and Cosentino, Louis C., to Renal Systems, Inc. Septum retaining means for percutaneous device. 4,405,320, Cl. 604-175.000.

Crescent Roofing Company Ltd.: *See*—
Brill-Edwards, Kenneth O. P., 4,405,396, Cl. 156-155.000.

Cresswell, Arnold W.; Ernsting, John; Turnbull, James A.; and Voss, Waldemar E. Respirators. 4,404,969, Cl. 128-201.230.

Crews, Harold R.; Carter, James H., II; and Sena, Ted, to Coulter Electronics, Inc. Method of stabilizing platelets for determining multiple platelet parameters in reference control and calibrator compositions; diluents therefor; and combination stabilization procedures. 4,405,719, Cl. 436-10.000.

Cristy, Nicholas G. Arrangement for releasing a fire curtain in a theater. 4,404,768, Cl. 49-5.000.

Cronin, John V. Automated screener. 4,404,903, Cl. 101-123.000.

Crowder, James P. System for mapping a physical variable. 4,405,930, Cl. 346-107.00R.

Cruz, Mamerto M., Jr., to Morca, Inc. Absorbent cellulosic structures. 4,405,324, Cl. 604-376.000.

CTS Corporation: *See*—
Calhoun, L. Owen; and Murray, Michael A., 4,404,779, Cl. 52-126.200.

Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Adsorbent unit for mounting in the upper portion of a refrigerant receiver. 4,405,347, Cl. 55-387.000.

Cullen, Mark, to Donahue Enterprises, Inc. Valve control assembly. 4,404,991, Cl. 137-636.100.

Cummins Engine Company, Inc.: *See*—
Smith, Joel D.; and Johnson, Joseph M., 4,404,931, Cl. 123-179.00H.

Cumpton, Wayne L.: *See*—
Payne, Arnold F.; Mauro, Gene A.; Cumpton, Wayne L.; and Orr, George J., 4,405,171, Cl. 296-19.000.

Cunard, Joel C.: *See*—
Boudreau, Robert J.; and Cunard, Joel C., 4,405,179, Cl. 301-2.500.

Cuno Melcher KG ME-Sportwaffen, Firma: *See*—
Wiethoff, Gunter, 4,404,748, Cl. 30-161.000.

Curchod, Donald B. Base assembly for wheel balancing machine. 4,404,851, Cl. 73-460.000.

Curran, Thomas F. System for controlling fan-out in a web offset press. 4,404,906, Cl. 101-211.000.

Currier, Robert G.: *See*—
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,703, Cl. 15-230.110.
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,999, Cl. 139-391.000.

Curtil, Remi, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method of and system for power generation by supercharged internal combustion engine. 4,404,805, Cl. 60-606.000.

Cwirzen, Casimir, to Northern Telecom Inc. Gas tube overvoltage protector with back-up gap. 4,405,967, Cl. 361-124.000.

Cyphelly, Ivan J. Fluid pressure unit with hydrostatic torque transmission by roller pistons. 4,404,895, Cl. 91-488.000.

Daekko Presenning Kompagni A/S: *See*—
Nielsen, Erik, 4,405,257, Cl. 405-19.000.

Dage, Richard C.; Palopoli, Frank P.; Schnettler, Richard A.; and Grisar, J. Martin, to Merrell Dow Pharmaceuticals Inc. 4-Pyridylimidazolones and method of use. 4,405,628, Cl. 424-263.000.

Dage, Richard C.: *See*—
Schnettler, Richard A.; Dage, Richard C.; and Grisar, Johann M., 4,405,635, Cl. 424-273.00R.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Katano, Seiji; and Atsumi, Masataka, 4,405,709, Cl. 430-307.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Tanaka, Teruaki, 4,404,834, Cl. 72-221.000.

Daimler-Benz Aktiengesellschaft: *See*—
Resch, Reinhard; and Krohn, Hellmut, 4,405,181, Cl. 303-9.000.
Resch, Reinhard, 4,405,183, Cl. 303-119.000.
Scheurenbrand, Dieter; and Kleinschmit, Einhard, 4,404,983, Cl. 137-74.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Di-Acetylene-terminated polyimide derivatives. 4,405,519, Cl. 548-423.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of di-acetylene-terminated polymide derivatives and dienophiles having terminal maleimide grops. 4,405,520, Cl. 548-423.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of di-acetylene-terminated polyimide derivatives with a polyimide having terminal ethylenic groups. 4,405,521, Cl. 548-423.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of di-acetylene-terminated polyimide derivatives and an dienophile having ethylene groups. 4,405,786, Cl. 546-66.000.

Dallman, Alfred C. Automotive fuel saving system. 4,404,950, Cl. 123-572.000.

Daniels, Peter, to United States of America, Navy. Turbulence generator for maximizing configuration tolerances of free flight ordnance. 4,405,100, Cl. 244-3.100.

D'Antonio, Nicholas F.: *See*—
Knabel, Walter; Klubitschko, Gerd; Stempfhuber, Lorenz; and D'Antonio, Nicholas F., 4,405,151, Cl. 280-612.000.

Dart Industries Inc.: *See*—
Nardelli, Christy A., 4,405,412, Cl. 204-54.00R.

Dassler, Armin A., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe, especially jogging shoe. 4,404,759, Cl. 36-129.000.

Data General Corporation: *See*—
Blau, Jonathan S.; and Rosen, Josh, 4,405,992, Cl. 364-748.000.

Datz, Rudolf: *See*—
Brand, Andreas; and Datz, Rudolf, 4,404,929, Cl. 122-412.000.

Davies, Glyndwr J., to Glacier Metal Company Limited, The. Polyarylene sulphide compositions. 4,405,740, Cl. 524-287.000.

Davies, John H.: *See*—
Gordon, Gerald M.; Cowan, Robert L., II; and Davies, John H., 4,406,012, Cl. 376-414.000.

Davis, Wayne: *See*—
Kolchinsky, Abel E.; Bouilun, John; and Davis, Wayne, 4,405,251, Cl. 403-9.000.

Davy, Robert F.; and Kremp, Wilhelm K., to Davy, Robert F. Tailgate loader. 4,405,279, Cl. 414-558.000.

Dawson, James E.: *See*—
Cochran, Gary L.; Dawson, James E.; and Stromberg, Gary D., 4,405,280, Cl. 414-685.000.

Dean, Walter K.; and Meltsner, Bernard R., to Ethyl Corporation. Process for ortho dealkylation of aromatic amines. 4,405,812, Cl. 564-409.000.

Dechaux, Charles. Turbo-generator for a rotary wing helicopter. 4,404,794, Cl. 60-39.161.

Decol Co., Ltd.: *See*—
Ushimaru, Chuji, 4,404,778, Cl. 52-101.000.

DeCristofaro, Nicholas J., to Allied Corporation. Homogeneous, ductile nickel-palladium brazing foils. 4,405,391, Cl. 148-403.000.

Deere & Company: *See*—
Wittren, Richard A., 4,405,030, Cl. 180-153.000.

Deets, Gary L.; and Trementozzi, Quiriano A., to Monsanto Company. Polyblends. 4,405,753, Cl. 525-68.000.

Degen, Helmut: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,405,330, Cl. 8-639.000.

Degussa Aktiengesellschaft: *See*—
Binder, Volker; Merk, Wolfgang; and Werle, Peter, 4,405,783, Cl. 544-267.000.
Binder, Volker; Merk, Wolfgang; and Werle, Peter, 4,405,783, Cl. 544-267.000.
Pfeifer, Alfred; Seif, Rudolf; and Holdt, Dietmar, 4,405,431, Cl. 204-202.000.

Dehne, Clarence A., to Jervis B. Webb Company. Combination enclosure/support for conveyor apparatus, and methods of constructing and utilizing same. 4,405,042, Cl. 198-687.000.

Deininger, J. Paul; and Dotson, Ronald L., to Olin Corporation. Process for preparing potassium ferrate (K_2FeO_4). 4,405,573, Cl. 423-150.000.

Deisenroth, Friedrich-Ulf. Production of plastic-bonded explosive substances. 4,405,534, Cl. 264-3.00C.

Deitz, Stephen J. Capsule inspection device. 4,405,049, Cl. 209-630.000.

Delaney, Dennis D.: *See*—
Fenton, Donald M.; Delaney, Dennis D.; and Stechmeyer, Frank W., 4,405,825, Cl. 585-13.000.

Delgmann, Lothar: *See*—
Brunnee, Curt; Delgmann, Lothar; and Marten, Gunter, 4,405,860, Cl. 250-288.000.

del Rio, Eddy H., to RCA Corporation. Ion implanter end processing station. 4,405,864, Cl. 250-441.100.

DeLuca, Raymond F., to Georgia-Pacific Corporation. Method for web cutting in rolled sheet material dispensers. 4,404,880, Cl. 83-42.000.

Demange, Michel: *See*—
Septier, Louis; and Demange, Michel, 4,405,545, Cl. 264-144.000.

De Marco, Vincent R.: *See*—
Hall, Eldon C.; Sewart, Harold H.; Sabo, Joseph D.; De Marco, Vincent R.; and Prisant, Millard B., 4,405,985, Cl. 364-423.000.

Demartini, Robert J. Rain gutter devices. 4,404,775, Cl. 52-12.000.

Demianczuk, Dionisyj W.; and Bingel, Carl J., to Republic Steel Corporation. Steel products such as bars, compositionally non-rimming and internally aluminum killed, having good surface condition. 4,405,381, Cl. 148-2.000.

Demianczuk, Dionisyj W.: *See*—
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., 4,405,380, Cl. 148-2.000.

Demmler, Kurt; and Ochs, Wolfram, to BASF Aktiengesellschaft. Curable epoxy resins. 4,405,765, Cl. 525-506.000.

Denki Onkyo Company Limited: *See*—
Ohtsu, Shinji, 4,405,910, Cl. 335-210.000.

Denning, Elizabeth R. Animal eye protection device. 4,404,789, Cl. 54-80.000.

Dennison Manufacturing Company: *See—*
Jodrey, Robert M.; and Pitts, Warren R., 4,405,301, Cl. 432-124.000.
Jodrey, Robert M., 4,405,403, Cl. 156-449.000.

Deschamps, Andre; Franckowiak, Sigismond; and Le Page, Jean-Francois, to Institut Francais Du Petrole. Process for converting heavy oils or petroleum residues to gaseous and distillable hydrocarbons. 4,405,442, Cl. 208-107.000.

Dessens, Jan A. H., to MacMillan Bloedel Limited. Panelboard with friction surface. 4,405,675, Cl. 428-156.000.

Detector Electronics Corp.: *See—*
Juaire, Michael P., 4,405,234, Cl. 356-239.000.

Detre, Tamas: *See—*
Angyan, Sandor; Racz, Istvan; Radvanyi, Erzsebet; Kovats, Ferenc; Detre, Tamas; and Sos, Jozsef, 4,405,353, Cl. 11-3.000.

Deubzer, Bernward: *See—*
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Devienne, Jules H. P., to Societe Nationale Industrielle Aerospatiale. Multichannel connection and method for transmitting pyrotechnic orders. 4,404,910, Cl. 102-200.000.

DeWan, Thomas E. Flexible container. 4,404,689, Cl. 2-247.000.

Dewing, Ernest W.; and Gesing, Adam J., to Alcan International Limited. Electrolytic refining of molten metal. 4,405,415, Cl. 204-67.000.

Diamond Shamrock Corporation: *See—*
Heilman, William P.; and Gullo, James M., 4,405,619, Cl. 424-249.000.
Solomon, Frank, 4,405,544, Cl. 264-127.000.

Dick, Richard J.: *See—*
Rodgers, Stephen D.; Dick, Richard J.; and McGinniss, Vincent D., 4,405,761, Cl. 525-404.000.

Dicke, William C., to Singer Company, The. Dovetail fixture. 4,405,004, Cl. 144-87.000.

Dickerson, Eugene D. Insert for vehicle tow bar. 4,405,148, Cl. 280-491.00E.

Dickinson nee Berryman, Kay H.; Smale, Terence C.; and Southgate, Robert, to Beecham Group Limited. β-Lactam antibacterial agents. 4,405,637, Cl. 424-274.000.

Diehl GmbH & Co.: *See—*
Sindermann, Paul, 4,404,912, Cl. 102-505.000.

Dienstbach, Ulrich, to Sulpetro Minerals Limited. Hydrometallurgical process for extracting metal values from complex ores containing arsenic and sulfur. 4,405,569, Cl. 423-27.000.

Dietz, Richard E.: *See—*
Capshew, Charles E.; Short, James N.; Welch, M. Bruce; and Dietz, Richard E., 4,405,769, Cl. 526-119.000.

Diez, Jacques: *See—*
Perot, Francois; Pouderoux, Jacqueline; and Diez, Jacques, 4,404,928, Cl. 122-32.000.

Dijkmans, Eise C.: *See—*
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,405,902, Cl. 330-271.000.

Dilmaghani, Hommayoun; Sgarz, Hugo; and Schulz, Hartmut, to Vereinigte Flugtechnische Werke GmbH. Airfoil flap actuation. 4,405,105, Cl. 244-213.000.

Dimter GmbH Maschinenfabrik: *See—*
Wiegand, Karl-Wolfram, 4,405,276, Cl. 414-119.000.

Di Schiena, Michele; and Orru, Vittoria, to Ausonia Farmaceutici s.r.l. Thiazolidine derivatives with antibiotic activity. 4,405,618, Cl. 424-246.000.

Discovision Associates: *See—*
Mayer, Bruno F. P., 4,405,540, Cl. 264-106.000.
Shoji, Robert M.; Chudy, John S.; and Eberly, Carlyle J., 4,406,000, Cl. 369-44.000.

Disselbeck, Dieter; and Speier, Klaus, to Hoechst Aktiengesellschaft. Process and device for separating mixtures of matter in the liquid phase. 4,405,460, Cl. 210-640.000.

Dixon, David; and Krupicka, William A., to Scovill Inc. Padlock having a replaceable cylinder. 4,404,825, Cl. 70-368.000.

Dixon, Richard D.: *See—*
Ruhl, John H.; and Dixon, Richard D., 4,405,273, Cl. 411-43.000.

Dizon, Edmund S.; and Moninski, Joseph P., Jr., to S&C Electric Company. Door interlock for electrical apparatus. 4,405,844, Cl. 200-50.00A.

Documation Incorporated: *See—*
Funkhouser, Richard L., 4,404,901, Cl. 101-93.020.

Doddapaneni, Narayan, to Honeywell Inc. High rate metal-sulfuryl chloride batteries. 4,405,693, Cl. 429-101.000.

Doheny, Anthony J., Jr.: *See—*
Bernard, David L.; Backus, John K.; and Doheny, Anthony J., Jr., 4,405,725, Cl. 521-112.000.

Doi, Yoshio: *See—*
Takagishi, Yasushi; Doi, Yoshio; Ohsuga, Kiichiro; Hoshi, Noboru; and Shionogi & Co., Ltd., 4,405,597, Cl. 424-35.000.

Dolgov, Anatoly V.: *See—*
Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.

Dome Petroleum Limited: *See—*
O'Rourke, Cameron; and Pilkington, Roger, 4,405,258, Cl. 405-60.000.

Donahue Enterprises, Inc.: *See—*
Cullen, Mark, 4,404,991, Cl. 137-636.100.

Doorakian, George A.: *See—*
Bertram, James L.; Doorakian, George A.; and Duquette, Lawrence G., 4,405,766, Cl. 525-507.000.

Dootson, Peter A.: *See—*
Payne, Charles E. G.; Jones, Thomas I. Y.; and Dootson, Peter A., 4,404,797, Cl. 60-39.281.

Dorakovski, Vanco. Method and apparatus for the manufacture of pulleys. 4,404,829, Cl. 72-84.000.

Doron, Joseph, to Bristol Babcock Inc. Switched frequency divider. 4,406,014, Cl. 377-107.000.

Dorsey, Edmund. Clutch using partial vacuum to resist separation. 4,404,713, Cl. 24-217.00R.

Dotson, Ronald L.: *See—*
Deininger, J. Paul; and Dotson, Ronald L., 4,405,573, Cl. 423-150.000.
Moore, Sanders H.; and Dotson, Ronald L., 4,405,465, Cl. 210-757.000.

Doubleday, Max; and Gallis, Anthony J., to Harsco Corporation. Gang form bolt. 4,405,112, Cl. 249-207.000.

Douty, George H.; Ritchie, Leon T.; and Snyder, Clair W., Jr., to AMP Incorporated. Narrow profile power distribution block. 4,405,189, Cl. 339-17.00C.

Dow Chemical Company, The: *See—*
Bertram, James L.; Doorakian, George A.; and Duquette, Lawrence G., 4,405,766, Cl. 525-507.000.
Filter, Harold E.; and Drake, Stevens S., 4,405,512, Cl. 252-628.000.
Harnden, Robert M.; and Baugh, Daniel W., Jr., 4,405,794, Cl. 548-229.000.
Lee, John M.; and Bauman, William C., 4,405,574, Cl. 423-157.000.
Lee, John M.; and Bauman, William C., 4,405,576, Cl. 423-181.000.
Sargent, Roger N., 4,405,485, Cl. 252-180.000.

Dow Corning Corporation: *See—*
Brady, Sam A.; and Elias, Michael G., 4,405,264, Cl. 405-270.000.

Downing, Edward J.; and Fisch, Richard S., to Minnesota Mining and Manufacturing Company. Protected vapor-deposited metal layers. 4,405,678, Cl. 428-215.000.

Doyen, Jean: *See—*
Resneau, Jean C.; Doyen, Jean; and Ribier, Robert, 4,404,745, Cl. 29-841.000.

Dragerwerk AG: *See—*
Albarda, Scato, 4,405,294, Cl. 417-488.000.
Pasternack, Adalbert, 4,405,348, Cl. 62-259.300.

Drake, Stevens S.: *See—*
Filter, Harold E.; and Drake, Stevens S., 4,405,512, Cl. 252-628.000.

Dravo Corporation: *See—*
Fenton, Edward A., Jr.; and Simpson, John F., Jr., 4,405,050, Cl. 209-668.000.

Dressler, Hans; Lederer, Donald A.; and Noe, James, to Koppers Company, Inc. Novel N-methylolated/methoxymethylated arylalkylsulfonamides. 4,405,755, Cl. 525-138.000.

Driggers, Randolph W.: *See—*
Lolley, Ted E.; and Driggers, Randolph W., 4,404,777, Cl. 52-60.000.

Drozd, Edward J.: *See—*
Pritchard, Robert W.; Drozd, Edward J.; and Lutz, Michael K., 4,405,306, Cl. 604-87.000.

Drummond, Peter D.: *See—*
Eberly, Joseph H.; Drummond, Peter D.; and Konopnicki, Marek J., 4,406,003, Cl. 370-3.000.

D'Silva, Themistocles D. J.: *See—*
Bushey, Dean F.; and D'Silva, Themistocles D. J., 4,405,632, Cl. 424-270.000.

Dubois, Jean-Claude: *See—*
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,862, Cl. 250-318.000.

Ducklo, Kenneth E.: *See—*
Nyquist, John D.; Kwasniewski, Gary K.; Thornton, Arthur W.; Vest, Paul E.; and Ducklo, Kenneth E., 4,405,492, Cl. 252-370.000.

Duckwall, Louis R., Jr., to Conoco Inc. Process for the production of alcohols from carboxylic acids. 4,405,819, Cl. 568-814.000.

Dudek, Edmund C., to Thor Power Tool Company. Pneumatic tool with muffler. 4,404,799, Cl. 60-370.000.

Dudley, Marvin: *See—*
Jeffreys, George A.; Tobey, James F., Jr.; and Price, Jean L., 4,405,649, Cl. 426-59.000.

Duerig, Thomas: *See—*
Albrecht, Joachim; Duerig, Thomas; and Weber, Walter, 4,405,387, Cl. 148-11.50R.

Dumousseau, Jean-Yves: *See—*
Grosbois, Jean; and Dumousseau, Jean-Yves, 4,405,591, Cl. 423-347.000.

Dunne, James. Rope ladder. 4,405,034, Cl. 182-190.000.

Duo-Fast Corporation: *See—*
Austin, Ronald, 4,405,071, Cl. 227-7.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cohen, Abraham B., 4,405,394, Cl. 156-83.000.
Howard, Edward G., Jr.; and Marsh, Frank D., 4,405,760, Cl. 525-383.000.
Schweitzer, Francis E., 4,405,729, Cl. 523-466.000.

Duquette, Lawrence G.: *See—*
Bertram, James L.; Doorakian, George A.; and Duquette, Lawrence G., 4,405,766, Cl. 525-507.000.

Duran, John A., to Avibank Mfg., Inc. Coupling mechanism. 4,404,714, Cl. 24-230.0AL.

Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Heterocyclic thioureas, isothioureas, guanidines and nitromethylene-amidines. 4,405,621, Cl. 424-250.000.

Durkoppwerke GmbH: *See—*
Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, 4,404,921, Cl. 112-291.000.

Durspek, William J.: *See—*
Mitchell, Daniel M.; and Durspek, William J., 4,405,976, Cl. 363-72.000.

Dutcher, Daniel P.; and Roccaforte, Harry I., to Champion International Corporation. Article carrier and a blank for forming the same. 4,405,078, Cl. 229-52.00B.

Duve, Gerard: *See—*
Hayes, Russell A.; and Duve, Gerard, 4,405,482, Cl. 252-99.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Schulte, Herbert; Brinkmann, Hans; and Sommermeyer, Uwe, 4,405,539, Cl. 264-77.000.

Dynatech Precision Sampling Corporation: *See—*
Harris, Rano J., Sr., 4,404,862, Cl. 73-864.160.

E. R. Squibb & Sons, Inc.: *See—*
Sykes, Richard B.; and Wells, Jerry S., 4,405,716, Cl. 435-119.000.

Eaby, Daniel G.; and Shuey, John R., to AMP Incorporated. Hermaphroditic connector. 4,405,192, Cl. 339-91.00R.

Earl, Robert A.; and Elmslie, James S., to Hercules Incorporated. Preparation of hydroxy-terminated poly(3,3-bisazidomethyloxetanes). 4,405,762, Cl. 525-410.000.

Easterling, J. W. Method and apparatus for vehicle door arm rest anchor repair. 4,405,252, Cl. 403-11.000.

Eastern Company, The: *See—*
Wolniak, Stanley C.; Spencer, Elbert M.; and Brown, Ronald L., 4,405,843, Cl. 200-44.000.

Eberly, Carlyle J.: *See—*
Shoji, Robert M.; Chudy, John S.; and Eberly, Carlyle J., 4,406,000, Cl. 369-44.000.

Eberly, Joseph H.; Drummond, Peter D.; and Konopnicki, Marek J., to University of Rochester, The. Optical transmission system. 4,406,003, Cl. 370-3.000.

Ebisawa, Hisashi: *See—*
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.

Ebner, Jerry R., to Monsanto Company. Oxidation and ammoxidation catalysts. 4,405,498, Cl. 252-432.000.

EC Erdolchemie GmbH: *See—*
Muller, Hans J.; Honig, Helmar; and Horlitz, Werner, 4,405,500, Cl. 252-433.000.

Eckel, Emery L., to Eckel Manufacturing Co., Inc. Power tongs. 4,404,876, Cl. 81-57.180.

Eckel Manufacturing Co., Inc.: *See—*
Eckel, Emery L., 4,404,876, Cl. 81-57.180.

Eckel, Max-Ferdinand, to Siemens Aktiengesellschaft. Method of producing ceramic material for zinc oxide varistors. 4,405,508, Cl. 252-518.000.

Eckhardt, Erich: *See—*
Kuchenbecker, Dietrich; and Eckhardt, Erich, 4,405,287, Cl. 417-216.000.

Ecklund, Lawrence M., to Motorola, Inc. Tone detector circuit. 4,405,837, Cl. 179-1.0GS.

Ecodyne Corporation: *See—*
Giannelli, Joseph F.; Flynn, George C.; and Ryan, Leo F., 4,405,466, Cl. 210-798.000.

Eden, Richard C., to Rockwell International Corporation. Schottky diode-diode field effect transistor logic. 4,405,870, Cl. 307-446.000.

Edgar, Richard H., to Raytheon Company. Combination microwave heating apparatus. 4,405,850, Cl. 219-10.55A.

Eftekhar, Nas S. Centering system for hip replacement. 4,404,692, Cl. 3-1.912.

Egami, Masafumi: *See—*
Tatebe, Yoshikazu; Egami, Masafumi; and Miyawaki, Toshimitsu, 4,404,936, Cl. 123-196.00R.

Egawa, Takeshi: *See—*
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,405,221, Cl. 354-173.000.

Eggensperger, Heinz: *See—*
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 549-417.000.

Egidi, Paolo; and Franchino, Fulvio, to Industrie Pirelli S.p.A. Process and device for vulcanizing power transmission belts. 4,405,555, Cl. 264-315.000.

Eguchi, Yukuo: *See—*
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.

Ehlers, Helmut H.: *See—*
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 549-417.000.

Ehmann, Werner; and Rinno, Helmut, to Hoechst Aktiengesellschaft. Aqueous polyvinyl ester dispersion, process for its preparation, and the use. 4,405,747, Cl. 524-503.000.

Eibel, Ludwig: *See—*
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Eickmann, Karl. Hydraulically operated air borne rotor craft. 4,405,103, Cl. 244-60.000.

Eilers, Carl G.; and Fockens, Pieter, to Zenith Radio Corporation. TV Sound transmission system. 4,405,944, Cl. 358-144.000.

Eisenberg, Hans-Jochen. Adjustable pedestal trestle for theater stages or the like. 4,405,116, Cl. 254-122.000.

Ekholm, Pertti, to Labsystems Oy. Filter device for the filtration of radiation. 4,405,206, Cl. 350-318.000.

Electric Power Research Institute: *See—*
Kulik, Conrad J.; and Atherton, Linda, 4,405,437, Cl. 208-10.000.

Eli Lilly and Company: *See—*
Miesel, John L., 4,405,552, Cl. 424-263.000.
Potter, Emerson L., 4,405,609, Cl. 424-177.000.

Elias, Michael G.: *See—*
Brady, Sam A.; and Elias, Michael G., 4,405,264, Cl. 405-270.000.

Ellendt, Gunther: *See—*
Wegener, Gerhard; Knofel, Hartmut; Ellendt, Gunther; and Petinaux, Marcel, 4,405,527, Cl. 260-453.0PH.

Elliott, Lloyd E., Jr.; and Hudson, John L., to Texaco Inc. Fail-safe methods for generating a pulse indicating the precise moment of firing of a gas exhausting gun. 4,405,033, Cl. 181-120.000.

Ellis, Fred E.: *See—*
Tew, Claude E.; and Ellis, Fred E., 4,405,230, Cl. 356-5.000.

Elmslie, James S.: *See—*
Earl, Robert A.; and Elmslie, James S., 4,405,762, Cl. 525-410.000.

Elsbernd, Gerald F., to Harris Corporation. Wind load reduction in tower mounted broadcast antennas. 4,405,928, Cl. 343-912.000.

Elsing, John W.; and Knopp, Steven D., to Magnetic Peripherals Inc. Pneumatic cartridge seal for computer disc drive cartridge. 4,405,136, Cl. 277-12.000.

Emerson, Clarence A., to King Tool Inc. Combination tool apparatus. 4,404,749, Cl. 30-164.900.

Emerson Electric Co.: *See—*
Loyd, Ronald C., 4,404,706, Cl. 15-344.000.

Endo, Hiroshi: *See—*
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.

Endo, Toshiaki: *See—*
Yamane, Yukio; Yoshiyuki, Kazuhiko; and Endo, Toshiaki, 4,405,174, Cl. 296-201.000.

Energy Conversion Devices, Inc.: *See—*
McCormick-Goodhart, Mark H.; Cannella, Vincent D.; and Minko, Robert, 4,404,926, Cl. 118-641.000.

Energy Development Associates, Inc.: *See—*
Galloway, James H., 4,405,891, Cl. 320-15.000.

Engelhard Corporation: *See—*
Carr, William F.; and Chen, James M., 4,405,507, Cl. 252-466.00B.

Engler, Edward M.; Patel, Vishnubhai V.; and Schumaker, Robert R., to International Business Machines Corporation. Heterofulvalene geminal dithiolate compounds and their selenium and tellurium analogs and a method of fabricating the same. 4,405,515, Cl. 260-239.00R.

Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, to Honda Giken Kogyo Kabushiki Kaisha. Motor vehicle. 4,405,027, Cl. 180-56.000.

Enrich, Carlos W. Plant growing apparatus. 4,404,767, Cl. 47-67.000.

Enterprises International, Inc.: *See—*
Makos, Ronald A.; and Young, James W., 4,405,275, Cl. 414-28.000.

Enting, David E.: *See—*
Frohwerk, Arthur E.; and Enting, David E., 4,404,879, Cl. 83-22.000.

Entremont, Jacques; and Levardon, Raymond, to Entremont S.A. Process for continuously separating fat from butter. 4,405,651, Cl. 426-241.000.

Entremont S.A.: *See—*
Entremont, Jacques; and Levardon, Raymond, 4,405,651, Cl. 426-241.000.

Environmental Chemicals, Inc.: *See—*
Cardarelli, Nathan F., 4,405,360, Cl. 71-117.000.

Envirotech Corporation: *See—*
Wells, Charles H., 4,405,453, Cl. 209-172.500.

Eoga, Anthony B. J., to Warner-Lambert Company. Method for preparing granulated perborate salts containing a polymeric fluorocarbon. 4,405,486, Cl. 252-186.310.

Erhardt, Paul W.: *See—*
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,405,642, Cl. 424-309.000.

Erickson, Alve J.: *See—*
Thulman, Robert D.; and Erickson, Alve J., 4,404,953, Cl. 126-77.000.

Eriksson, Borje: *See—*
Norback, Per; and Eriksson, Borje, 4,405,533, Cl. 261-111.000.

Erlandsson, Lars: *See—*
Jansson, Conny; Erlandsson, Lars; and Appelkvist, Rolf, 4,404,746, Cl. 30-124.000.

Ernsting, John: *See—*
Cresswell, Arnold W.; Ernsting, John; Turnbull, James A.; and Voss, Waldemar E., 4,404,969, Cl. 128-201.230.

Erwin, Josiephine Reed: *See—*
Erwin, Robert L., deceased; and Erwin, Josiephine Reed, executrix, 4,405,113, Cl. 251-168.000.

Erwin, Josiephine Reed, executrix: *See*—
Erwin, Robert L., deceased; and Erwin, Josiephine Reed, executrix, 4,405,113, Cl. 251-168.000.

Erwin, Robert L., deceased; and by Erwin, Josiephine Reed, executrix, to Erwin, Josiephine Reed. Reciprocating expandable gate valve. 4,405,113, Cl. 251-168.000.

Escher Wyss GmbH: *See*—
Selder, Harald, 4,405,450, Cl. 209-3.000.

Escher Wyss Limited: *See*—
Christ, Alfred; and Miesch, Johann, 4,404,724, Cl. 29-116.0AD.

Esco Corporation: *See*—
Hahn, Frecerick C.; Barber, William R., Jr.; and Hampel, David A., 4,404,760, Cl. 37-142.00R.
Northe, Melvin M.; and Larson, Dean W., 4,404,712, Cl. 24-129.00R.

Esper, Herbert. Collapsible skis. 4,405,150, Cl. 280-603.000.

Estes, R. Ray: *See*—
Fisher, E. Eugene; Estes, R. Ray; Lokken, Orrin D.; and Paguette, Elmer G., 4,405,647, Cl. 426-4.000.

Etablissements Bolle Georges, Robert et Maurice: *See*—
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Etablissements Francois Salomon & Fils: *See*—
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Ethicon, Inc.: *See*—
Flower, David I.; and Schuler, Michael, 4,405,044, Cl. 206-44.120.

Ethyl Corporation: *See*—
Dean, Walter K.; and Meltsner, Bernard R., 4,405,812, Cl. 564-409.000.
Everly, Charles, 4,405,528, Cl. 260-465.00F.
Seemuth, Paul D., 4,405,333, Cl. 44-53.000.
Seemuth, Paul D., 4,405,334, Cl. 44-53.000.
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Walter, Thomas J., 4,405,792, Cl. 546-346.000.

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Giacchetti, Giancarlo; Ramsch, Jurgen; and Walker, Clive T., 4,405,861, Cl. 250-305.000.

Evans, Alvin S., Sr. Pump and valve assembly for penile implant. 4,404,968, Cl. 128-79.000.

Evans, Robert T.: *See*—
Cefarelli, Frank P.; and Evans, Robert T., 4,405,201, Cl. 350-96.210.

Evans, Walter R.: *See*—
Miller, Harry C.; and Evans, Walter R., 4,404,823, Cl. 70-333.00A.

Everett/Charles Test Equipment, Inc.: *See*—
Fettig, Lyle A., 4,405,191, Cl. 339-75.00M.

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Evertz, Egon; and Rahn, Helmut, to Evon Evertz. Method and apparatus for a surface stripping treatment of objects consisting of iron with a high carbon content. 4,405,383, Cl. 148-9.500.

Evon, Emile: *See*—
Beaussier, Michel; Lesch, Henry; and Evon, Emile, 4,405,665, Cl. 428-17.000.

Evon Evertz: *See*—
Evertz, Egon; and Rahn, Helmut, 4,405,383, Cl. 148-9.500.

Evreka, Inc.: *See*—
Cerami, Anthony, 4,405,606, Cl. 424-177.000.

Ex-Cell-O Corporation: *See*—
Skrycki, Robert R., 4,405,138, Cl. 277-235.00B.

Excalibur Automobile Corporation: *See*—
Stevens, David B., 4,405,140, Cl. 280-16.000.

Exploration Logging, Inc.: *See*—
Mumby, Edward S., 4,405,021, Cl. 175-48.000.

Extracorporeal Medical Specialties, Inc.: *See*—
Pollock, Elisabeth M., 4,405,327, Cl. 8-94.110.

Exxon Research and Engineering Co.: *See*—
Foroulis, Z. Andrew, 4,405,584, Cl. 423-228.000.
Sartori, Guido; and Savage, David W., 4,405,577, Cl. 423-223.000.
Sartori, Guido; and Thaler, Warren A., 4,405,578, Cl. 423-223.000.
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Sartori, Guido; Savage, David W.; and Stogryn, Eugene L., 4,405,585, Cl. 423-228.000.
Sartori, Guido; and Thaler, Warren A., 4,405,586, Cl. 423-233.000.
Savage, David W.; Sartori, Guido; and Stogryn, Eugene L., 4,405,581, Cl. 423-226.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, 4,405,580, Cl. 423-226.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, 4,405,582, Cl. 423-228.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, 4,405,583, Cl. 423-228.000.
Stogryn, Eugene L.; and Sartori, Guido, 4,405,811, Cl. 564-506.000.

F. Korbel and Bros.: *See*—
Jordan, James L.; Huntsinger, James E.; Steinke, Dale F.; and Williams, David W., 4,405,997, Cl. 366-111.000.

Fahnler, Friedrich: *See*—
Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahnler, Friedrich; and Brassat, Bert, 4,405,748, Cl. 524-504.000.

Fahrion, Karl. Method of connecting flexible tubular duct and a connector. 4,404,726, Cl. 29-432.200.

Faltin, Hans G. High speed feeding and transport of paper sheet products. 4,405,122, Cl. 271-8.00A.

Farmer, Douglas A., Jr.: *See*—
Lines, Ellwood L., Jr.; and Farmer, Douglas A., Jr., 4,405,076, Cl. 229-3.5MF.

Farquharson, Charles R., to Amer Sport International Inc. Hockey helmet. 4,404,690, Cl. 2-420.000.

Faulkner, Bobby P.; and Weinecke, Michael H., to Allis-Chalmers Corporation. Process for recovery of different weight fractions of oil from shale. 4,405,438, Cl. 208-11.00R.

Fauss, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of silylisocyanates. 4,405,803, Cl. 556-410.000.

Feltrin, Galiano. Fuel systems for internal combustion engines. 4,404,948, Cl. 123-546.000.

Fenton, Donald M.; Delaney, Dennis D.; and Stechmeyer, Frank W., to Union Oil Company of California. Pour point reduction of syncrude. 4,405,825, Cl. 585-13.000.

Fenton, Edward A., Jr.; and Simpson, John F., Jr., to Dravo Corporation. Quick roll adjustment for a roller screen conveyor. 4,405,050, Cl. 209-668.000.

Ferneau, Richard H., to Adler, Marianne. High deck ambulance cart. 4,405,172, Cl. 296-20.000.

FerroFil A/S: *See*—
Kolle, Kjell; and Johannessen, Svein, 4,405,855, Cl. 219-501.000.

Fetterman, David S.: *See*—
Moore, Calvin E.; Hutchinson, Mark E.; and Fetterman, David S., 4,405,572, Cl. 423-54.000.

Fettig, Lyle A., to Everett/Charles Test Equipment, Inc. Low insertion force actuable interface for electrical contacts. 4,405,191, Cl. 339-75.00M.

Fiat Auto S.p.A.: *See*—
Piano, Renzo, 4,405,173, Cl. 296-146.000.

Fiber Industries, Inc.: *See*—
Cobb, Arnold J., 4,405,548, Cl. 264-176.00F.

Fichtel & Sachs AG: *See*—
Butz, Hans, 4,405,180, Cl. 301-111.000.

Fields, Davis S., Jr.: *See*—
Chow, William W.; Fields, Davis S., Jr.; Hu, Paul Y.; and Lopez, Jorge L., 4,405,961, Cl. 360-129.000.

Fields, Ellis K., to Standard Oil Company (Indiana). Process for preparation of benzophenone, anthraquinone and O-dibenzoylbenzene. 4,405,523, Cl. 260-369.000.

Fikart, Josef: *See*—
Taylor, Alistair W.; Fikart, Josef; and Thompson, David, 4,405,897, Cl. 324-782.000.

Filter, Harold E.; and Drake, Stevens S., to Dow Chemical Company, The. Process for encapsulating radioactive organic liquids in a resin. 4,405,512, Cl. 252-628.000.

Finkbeiner, Ernest, to Mid-West Transformer Company. Coil body. 4,405,913, Cl. 336-98.000.

Finnigan Mat GmbH: *See*—
Brunnee, Curt; Delgmann, Lothar; and Marten, Gunter, 4,405,860, Cl. 250-288.000.

Fiorentino, Ermenegildo; Wojtowicz, Edward A.; and Leadlie, Robert J., to Burroughs Corporation. Clamp device for retaining printed circuit boards under high shock conditions. 4,405,972, Cl. 361-417.000.

Firestone Tire & Rubber Company, The: *See*—
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,405,532, Cl. 260-816.00R.

Fisch, Richard S.: *See*—
Downing, Edward J.; and Fisch, Richard S., 4,405,678, Cl. 428-215.000.

Fischer, Herbert: *See*—
Schlauer, Johann; Fischer, Herbert; and Kriebel, Manfred, 4,405,593, Cl. 423-574.00R.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink supply arrangement for an offset printing machine. 4,404,909, Cl. 101-350.000.

Fischer, Michael A., to Grinnell Fire Protection Systems Company, Inc. Deflector with surface for circumferentially redistributing fluid for improved spray uniformity. 4,405,018, Cl. 169-37.000.

Fischer, Wilfried; and Hasenauer, Dieter, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,405,696, Cl. 429-104.000.

Fisher, Charles B.; and Fisher, Sidney T. Dual-signal A-M receiving apparatus. 4,406,006, Cl. 370-119.000.

Fisher, E. Eugene; Estes, R. Ray; Lokken, Orrin D.; and Paguette, Elmer G., to Wm. Wrigley Jr. Company. Method of compacting chewing gum base. 4,405,647, Cl. 426-4.000.

Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,406,006, Cl. 370-119.000.

Fisons, Limited: *See*—
Brown, Kenneth, 4,405,598, Cl. 424-45.000.

Fitzpatrick, Joseph W.; and Schmidt, Harold N., to Toms River Chemical Corporation. Vat dyestuff prepared from crude anthraquinone mixtures. 4,405,785, Cl. 546-30.000.

Flannagan, Stephen T.: *See*—
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,406,013, Cl. 377-29.000.

Flemming, Donald C., to International Business Machines Corporation. Pseudo synchronous clocking. 4,405,898, Cl. 328-72.000.

Flexello Casters & Wheels Limited: *See*—
Walker, Philip S., 4,404,707, Cl. 16-31.00R.

Flower, David I.; and Schuler, Michael, to Ethicon, Inc. Dispenser box for packages of sterile sutures. 4,405,044, Cl. 206-44.120.
Floyd, John: *See—*
Lancaster, Jack; Floyd, John; and Harvey, William, 4,404,973, Cl. 128-654.000.
Flynn, George C.: *See—*
Giannelli, Joseph F.; Flynn, George C.; and Ryan, Leo F., 4,405,466, Cl. 210-798.000.
FMC Corporation: *See—*
Change, Jun H., 4,405,357, Cl. 71-88.000.
Talafuse, Larry J., 4,405,014, Cl. 166-72.000.
Williams, Michael R., 4,405,162, Cl. 285-95.000.
Fockens, Pieter: *See—*
Eilers, Carl G.; and Fockens, Pieter, 4,405,944, Cl. 358-144.000.
Fogel, Joseph: *See—*
Gibson, Richard J.; and Fogel, Joseph, 4,405,375, Cl. 106-277.000.
Ford Motor Company: *See—*
Blechinger, Chester J., 4,404,858, Cl. 73-861.020.
Hoard, John W.; and Tuttle, Richard R., 4,404,946, Cl. 123-486.000.
Stockton, Thomas R., 4,405,288, Cl. 417-220.000.
Wade, Wallace R., 4,404,796, Cl. 60-274.000.
Formax, Inc.: *See—*
Sandberg, Glenn A.; and Lindee, Scott A., 4,405,186, Cl. 414-21.000.
Foroulis, Z. Andrew, to Exxon Research and Engineering Co. Process for removing acidic gases. 4,405,584, Cl. 423-228.000.
Forster, Michel; Jaouen, Adrien; Jorda, Alain; and Rampin, Pierre, to Commissariat a l'Energie Atomique. Process and device for monitoring the functioning of a liquid-liquid extraction column. 4,405,988, Cl. 364-502.000.
Foster, Robert A. L.; and Childs, Geoffrey H. L., to Post Office. Elimination of display blanks resulting from the use of character attribute codes in a videotex type system. 4,405,830, Cl. 178-30.000.
Foster Wheeler Energy Corporation: *See—*
Neale, Thomas J.; Alverson, Frederick C.; and Karg, John S., 4,405,561, Cl. 422-145.000.
Stewart, Robert D.; and Gamble, Robert L., 4,404,755, Cl. 34-57.00A.
Foust, Robert K. Coffin bed adjusting apparatus. 4,404,716, Cl. 27-12.000.
Fox, Irwin: *See—*
Samuels, Alvin, 4,405,563, Cl. 422-169.000.
Frame, Norman J., to W. H. Brady Co. Switching contact. 4,405,849, Cl. 200-262.000.
Franchino, Fulvio: *See—*
Egidi, Paolo; and Franchino, Fulvio, 4,405,555, Cl. 264-315.000.
Franckowiak, Sigismond: *See—*
Deschamps, Andre; Franckowiak, Sigismond; and Le Page, Jean-Francois, 4,405,442, Cl. 208-107.000.
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Optical combustion sensor system. 4,404,841, Cl. 73-35.000.
Franklin, Joseph E.: *See—*
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., 4,405,380, Cl. 148-2.000.
Franklin, Paul R., Jr. CO_2 Snow cooler with snow splitting bottom. 4,404,818, Cl. 62-384.000.
Franz, John E., to Monsanto Company. Salts of N-phosphonomethylglycine. 4,405,531, Cl. 260-501.120.
Franz Plasser Bahnbauma-Schinen-Industriegesellschaft mbH: *See—*
Theurer, Josef, 4,404,913, Cl. 104-12.000.
Fraval, Robert H.; and Oakford, Howerd P., to National Research Development Corporation. Weighing devices. 4,405,024, Cl. 177-200.000.
Frederick, David C., to Hope Plastics Corporation. Traversing core yarn guide for spinning frames. 4,404,790, Cl. 57-12.000.
Freiborg, Bennie. Multi purpose roof piece. 4,404,783, Cl. 52-518.000.
Freitag, Dieter; Reinking, Klaus; and Tacke, Peter, to Bayer Aktiengesellschaft. Use of hydrogenated polybenzyls as a mould-release agent for aromatic polyesters. 4,405,554, Cl. 264-300.000.
French, Michael P.: *See—*
Tults, Juri; and French, Michael P., 4,405,947, Cl. 358-193.100.
Frentzen, Hermann-Josef: *See—*
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.
Freund, Samuel M. Method for removal of phosgene from boron trichloride. 4,405,423, Cl. 204-157.10R.
Frey, Volker: *See—*
John, Peter; Artes, Reinhold; Frey, Volker; and Scherer, Matthias, 4,405,804, Cl. 556-476.000.
Frick Company: *See—*
Garland, Milton W., 4,404,810, Cl. 62-73.000.
Fridley, Kenneth P.; and Fridley, Robert E. Skid pad for moving heavy items. 4,405,673, Cl. 428-80.000.
Fridley, Robert E.: *See—*
Fridley, Kenneth P.; and Fridley, Robert E., 4,405,673, Cl. 428-80.000.
Friedrich, Wilhelm: *See—*
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.
Frisbee, Claude M., to J. I. Case Company. Adjustment and stabilizer mechanism for dozer blade. 4,405,019, Cl. 172-816.000.
Frith, Marvin E. Tool. 4,404,835, Cl. 72-325.000.
Fritz Studer AG: *See—*
Renker, Hansjorg, 4,405,683, Cl. 428-323.000.
Fritz, Thomas A.; and Shrode, James W. Portable chain saw sharpening kit with cutting link alignment means and method for using same. 4,404,871, Cl. 76-25.00A.
Fritz, Thomas A. Portable chain saw sharpening kit with depth gauge filing attachment and method of using same. 4,404,872, Cl. 76-25.00A.
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., to ACF Industries, Incorporated. Clamping assembly for lifting heavy objects having a bulbous engagement portion. 4,405,168, Cl. 294-103.00R.
Frohlich, Alfons; and Griessbaum, Karl, to Opti Patent-, Forschungs- und Fabrikations AG. Woven slide fastener stringer. 4,404,998, Cl. 139-384.00B.
Frohwerk, Arthur E.; and Enting, David E., to Procter & Gamble Company, The. Accurately placed stress concentrating aperture in flexible packages. 4,404,879, Cl. 83-22.000.
Frye, Kenneth G.; Grody, Donald R.; and Guild, Gerald A., to Beloit Corporation. Air reject gate. 4,405,126, Cl. 271-279.000.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrrolo[3,4-d] [2] benzazepines. 4,405,518, Cl. 260-245.700.
Fuchs, Otto; Kroh, Adolf; and Teige, Wolfgang, to Hoechst Aktiengesellschaft. Process for mass coloring thermoplastic plastics. 4,405,734, Cl. 524-90.000.
Fuchs, Otto; Hunger, Klaus; Weber, Dieter; and Zunker, Reinhard, to Hoechst Aktiengesellschaft. 1,3,4-Oxadiazoles. 4,405,793, Cl. 548-131.000.
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, to Bayer Aktiengesellschaft. Combating arthropods with fluorine-containing phenylacetic acid esters. 4,405,639, Cl. 424-278.000.
Fuhrmeister, Ralph, to Furma Manufacturing Co. Pty. Ltd. Method and apparatus for mounting rivets or the like in a flexible carrier. 4,404,742, Cl. 29-798.000.
Fuji Electric Company, Ltd.: *See—*
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.
Fuji Photo Film Co., Ltd.: *See—*
Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, 4,405,711, Cl. 435-4.000.
Takahashi, Yonosuke; Wada, Minoru; and Hasegawa, Eiichi, 4,405,706, Cl. 430-271.000.
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,405,704, Cl. 430-74.000.
Yamada, Yasuyuki; Tsuji, Nobuo; Okita, Tsutomu; and Mukunoki, Yasuo, 4,405,481, Cl. 252-62.540.
Fuji Xerox Co., Ltd.: *See—*
Omori, Takashi; Koguchi, Kenji; Yamagishi, Masahiko; and Takeuchi, Higehumi, 4,405,951, Cl. 358-256.000.
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,405,123, Cl. 271-22.000.
Fujieda, Mamoru: *See—*
Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, 4,404,846, Cl. 73-118.000.
Fujii, Hideharu: *See—*
Ishii, Kiyoichi; Fujii, Hideharu; and Kobayashi, Kenji, 4,405,932, Cl. 357-13.000.
Fujii, Tetsuya; Oguchi, Yukio; Sumita, Norio; and Goto, Isamu, to AMSTED Industries Incorporated. Method of manufacturing complex metallic plate. 4,405,295, Cl. 419-28.000.
Fujii, Yohji; and Minowa, Junichiro, to Nippon Telegraph and Telephone Public Corporation. Blazed diffraction grating structures and method of manufacturing the same. 4,405,405, Cl. 156-633.000.
Fujikawa, Yasuo, to Nissan Motor Company, Limited. Fuel-supply control system for gas-turbine engine. 4,404,945, Cl. 123-478.000.
Fujimoto, Masayuki: *See—*
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,472, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,473, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,474, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,475, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,476, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,478, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,479, Cl. 252-62.3BT.
Fujimoto, Takanori; and Tada, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Magnet ignition device. 4,404,952, Cl. 123-602.000.
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, to Nippon Sheet Glass Co. Ltd.; and Sumitomo Chemical Company, Limited. Coated shaped article of polycarbonate type resin. 4,405,679, Cl. 428-216.000.
Fujisawa, Kyuichi, to Alps Electric Co., Ltd. Pen type multi-color recording device. 4,405,931, Cl. 346-139.00R.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,405,617, Cl. 424-246.000.

Fujita, Shoichi; Kodama, Katsuhisa; and Yuge, Kiyohiro, to Takeda Chemical Industries, Ltd. Method for producing fire-resistant, thermally insulating board. 4,405,682, Cl. 428-317.700.

Fujita, Toshio: *See*—
Otoguro, Yasuo; Hashimoto, Katukuni; Takahashi, Hisashi; and Fujita, Toshio, 4,405,369, Cl. 75-126.00C.

Fujitsu Limited: *See*—
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.
Sakurai, Junji, 4,404,735, Cl. 29-576.00W.
Sasaki, Nobuo, 4,404,733, Cl. 29-571.000.
Shirai, Kazunari; and Tanaka, Izumi, 4,405,995, Cl. 365-174.000.

Fujiwara, Akiko; and Hoshino, Tatsuo, to Hoffmann-La Roche Inc. Process for the preparation of optically active anthracycline glycosides A and B. 4,405,713, Cl. 435-78.000.

Fukagawa, Yasuyuki: *See*—
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,405,123, Cl. 271-22.000.

Fukaya, Masaki: *See*—
Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, 4,405,915, Cl. 338-15.000.

Fukushima, Takashi, to Ricoh Company, Ltd. Variable speed signal printing apparatus. 4,405,245, Cl. 400-144.200.

Fulghum Industries, Inc.: *See*—
McKnight, James B., 4,404,986, Cl. 137-355.170.

Fuller, Larry E.: *See*—
Cracauer, Raymond F.; Fuller, Larry E.; Martinez, Felix J.; and Cosentino, Louis C., 4,405,320, Cl. 604-175.000.

Fuller, William J., to Auto Stop Corporation. Automatic shutoff valve. 4,405,000, Cl. 141-198.000.

Fulton, Robert W. Electrical connector for high fidelity audio equipment. 4,405,196, Cl. 339-273.00F.

Funada, Fumiaki; Takamatsu, Toshiaki; Yutaka, Ishii; and Wada, Tomio, to Sharp Kabushiki Kaisha. Matrix liquid-crystal display devices. 4,405,209, Cl. 350-341.000.

Funaki, Hidefumi: *See*—
Kobayashi, Haruhiro; Funaki, Hidefumi; and Sakurai, Takehiro, 4,405,436, Cl. 204-298.000.

Funakubo, Tomoki: *See*—
Kasuga, Muneo; Nishikawa, Masaji; and Funakubo, Tomoki, 4,405,224, Cl. 355-3.00R.

Funkhouser, Richard L., to Documation Incorporated. Striker assembly for line printers. 4,404,901, Cl. 101-93.020.

Furihata, Toshikazu: *See*—
Hasui, Hiroshi; Furihata, Toshikazu; Takanashi, Kazuko; and Ohmori, Masahiko, 4,405,807, Cl. 560-75.000.

Furma Manufacturing Co. Pty. Ltd.: *See*—
Fuhrmeister, Ralph, 4,404,742, Cl. 29-798.000.

Furukawa, Akihiko: *See*—
Sasaki, Gen; Taguchi, Minoru; Kanzaki, Koichi; and Furukawa, Akihiko, 4,404,738, Cl. 29-577.00C.

Futamata, Hideo: *See*—
Matsunaga, Mamoru; Usami, Teruo; Okuda, Haruo; and Futamata, Hideo, 4,405,376, Cl. 106-300.000.

Fuziwara, Akio: *See*—
Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.

G. A. Pfleiderer GmbH & Co., KG: *See*—
Rother, Bruno; and Trommen, Hartmut, 4,405,398, Cl. 156-242.000.

G. D. Searle & Co.: *See*—
Wagner, Hans, 4,405,780, Cl. 544-263.000.

Gabriele, Leonard A., to Lear Siegler, Inc. Pot broach machine with turn-over loader. 4,405,270, Cl. 409-244.000.

Gadelius K.K.: *See*—
Okamoto, Eiji, 4,405,013, Cl. 165-86.000.

GAF Corporation: *See*—
Chakrabarti, Paritosh M.; Hashem, Mohamed M.; and Cheng, Tom M. H., 4,405,799, Cl. 549-369.000.
Nelsen, Suzanne B., 4,405,749, Cl. 524-100.000.

Gaitanopoulos, Dimitri; and Weinstock, Joseph, to SmithKline Beckman Corporation. 3-Carboxy-2-azabicyclo[2.2.1]heptane derivatives. 4,405,787, Cl. 546-112.000.

Gallaro, Anthony V.; and Hedler, Robert A., to North American Philips Consumer Electronics Corp. Data display CRT having a yellow-emitting screen. 4,405,880, Cl. 313-467.000.

Gallelli, Joseph F.: *See*—
Chatterji, Dulal C.; and Gallelli, Joseph F., 4,405,611, Cl. 424-180.000.

Gallis, Anthony J.: *See*—
Doubleday, Max; and Gallis, Anthony J., 4,405,112, Cl. 249-207.000.

Galloway, James H., to Energy Development Associates, Inc. Control system for electric powered vehicle. 4,405,891, Cl. 320-15.000.

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Stewart, Robert D.; and Gamble, Robert L., 4,404,755, Cl. 34-57.00A.

Ganellin, Charon R.: *See*—
Durant, Graham J.; and Ganellin, Charon R., 4,405,621, Cl. 424-250.000.

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Hilfman, Lee; and Gatsis, John G., 4,405,447, Cl. 208-251.00R.

Gauger, Richard L. Tool grinding fixture. 4,404,773, Cl. 51-218.00A.

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Vivier, Ghislain; and Gauthier, Aurele, 4,405,069, Cl. 225-93.000.

Gebeke, Charles D., to Minnesota Mining and Manufacturing Company. Cassette with a slack limiter tab. 4,405,097, Cl. 242-199.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Brandenburg, Helmut, 4,405,178, Cl. 299-81.000.

Gebr. Happich GmbH: *See*—
Janz, Joachim; and Svejkovsky, Ulrich, 4,404,709, Cl. 16-111.00R.

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Palomo-Coll, Alberto; and Palomo-Coll, Antonio L., 4,405,782, Cl. 544-21.000.

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Piesik, Edward T., 4,404,887, Cl. 89-1.816.

General Electric Company: *See*—
Cavero, Leonardo P., 4,405,966, Cl. 361-80.000.
Gordon, Gerald M.; Cowan, Robert L., II; and Davies, John H., 4,406,012, Cl. 376-414.000.
Kinson, Philip L., 4,405,739, Cl. 524-117.000.
Nondahl, Thomas A., 4,405,873, Cl. 310-156.000.
Pritzkow, Dennis H.; Zabel, Jack H.; and Lang, George R., 4,405,863, Cl. 250-385.000.
Rampel, Guy, 4,405,700, Cl. 429-248.000.

General Foods Corporation: *See*—
Zemelman, Valery B.; and Kleiner, Fredric, 4,404,807, Cl. 62-1.000.

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Bell, Albert H., III; and Hyde, James C., 4,404,806, Cl. 60-737.000.
Palma, James D.; and Seino, Michael J., 4,405,912, Cl. 335-260.000.
Rosenkrands, Johannes W., 4,405,143, Cl. 280-403.000.

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Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,405,566, Cl. 423-15.000.

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Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,405,667, Cl. 428-35.000.

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Georgia-Pacific Corporation: *See*—
DeLuca, Raymond F., 4,404,880, Cl. 83-42.000.

Georgiev, Vesselin Y.; and Mednikarov, Vladimir S., to Institute Po Mechanika I Biomechanika. Hydro-pneumatic accumulator for impulse sprinkling. 4,405,084, Cl. 239-99.000.

Gerger, Wolfgang: *See*—
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Hanulik, Jozef, 4,405,430, Cl. 204-400.000.

Gesing, Adam J.: *See*—
Dewing, Ernest W.; and Gesing, Adam J., 4,405,415, Cl. 204-67.000.

GF Business Equipment, Inc.: *See*—
McCracken, Richard W.; Textoris, Melvin A.; and Williams, Philip J., 4,404,785, Cl. 52-290.000.

Giacchetti, Giancarlo; Ransch, Jurgen; and Walker, Clive T., to European Atomic Energy Community (Euratom). Secondary-electron detector for analyzing irradiated samples for scanning electron microscopes and microprobes. 4,405,861, Cl. 250-305.000.

Giacobbe, Thomas J.; and Tsien, Grace, to Rhone-Poulenc, Inc. Process for recovering and purifying herbicidal phenoxybenzoic acid derivatives. 4,405,805, Cl. 560-21.000.

Giannelli, Joseph F.; Flynn, George C.; and Ryan, Leo F., to Ecodyne Corporation. Backwash method and apparatus. 4,405,466, Cl. 210-798.000.

Gibbons, Alfred M., to Kanmark, Inc. Fixture for perforated board. 4,405,110, Cl. 248-221.200.

Gibbons, Edward J., to Colgate-Palmolive Company. Method and apparatus for manufacturing dentifrice containing dispersed speckles. 4,405,399, Cl. 156-243.000.

Gibbs, Charles G.: *See*—
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,405,791, Cl. 546-316.000.

Gibson, Richard J.; and Fogel, Joseph, to B. F. Goodrich Company, The. Niyuminouzbituminous emulsion roof resaturant. 4,405,375, Cl. 106-277.000.

Giessen, Bill C.: *See*—
Ray, Ranjan; Panchanathan, Viswanathan; and Giessen, Bill C., 4,405,368, Cl. 75-124.000.

Gifford, Howard: *See*—
Stuck, Earl N.; Pigney, Keith D.; and Gifford, Howard, 4,405,296, Cl. 425-6.000.

Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Mud-sill anchor. 4,404,781, Cl. 52-295.000.

Gilson, John D., to Carrier Corporation. Air conditioning economizer control method and apparatus. 4,404,815, Cl. 62-180.000.

Gipson, Robert M.: *See*—
McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., 4,405,015, Cl. 166-267.000.
Girgis, Mikhail M., to PPG Industries, Inc. Aqueous, adhesive coating composition with a non-self-crosslinkable elastomer for use with filamentary materials. 4,405,746, Cl. 524-501.000.
Glacier Metal Company Limited, The: *See*—
Davies, Glyndwr J., 4,405,740, Cl. 524-287.000.
Glaser, Mark C.: *See*—
Allen, Richard G.; and Glaser, Mark C., 4,405,017, Cl. 166-382.000.
Gmundner Zementwerke Hans Hatschek Aktiengesellschaft: *See*—
Kainzner, Adolf; Gerger, Wolfgang; and Lukas, Walter, 4,405,723, Cl. 501-36.000.
Gobel, Wilhelm: *See*—
Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, 4,405,742, Cl. 524-315.000.
Goebel, Franz; and Kealey, Kathleen M., to GTE Products Corporation. Electrochemical cell. 4,405,694, Cl. 429-101.000.
Goetz, Richard W., to National Distillers and Chemical Corporation. Process for preparing glycolaldehyde and/or ethylene glycol. 4,405,821, Cl. 568-862.000.
Golar, Paul: *See*—
Kinkelaar, Edmund W.; and Golar, Paul, 4,405,663, Cl. 427-428.000.
Goldberg, Edward M.; and Bazell, Seymour, to UreSil Company. Body fluid suction device indicators. 4,404,924, Cl. 116-270.000.
Goncharov, Boris K.: *See*—
Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.
Goodyear Tire & Rubber Company, The: *See*—
Welter, Thomas N. H., 4,405,007, Cl. 152-353.00R.
Googin, John M.; Napier, John M.; and Travaglini, Michael A. Process for removing halogenated aliphatic and aromatic compounds from petroleum products. 4,405,448, Cl. 208-262.000.
Gordon, Gerald M.; Cowan, Robert L., II; and Davies, John H., to General Electric Company. Nuclear fuel elements having a composite cladding. 4,406,012, Cl. 376-414.000.
Gordon, Pat L.; Calfee, Richard V.; and Miner, Jay, to Intermedics, Inc. Implantable device with microprocessor control. 4,404,972, Cl. 128-419.0PG.
Gorman, Kenneth G.; and Marx, Richard A., to Valley Rolling Mills, Inc. Antisiphon lap joint for building sheets. 4,404,784, Cl. 52-534.000.
Goto, Isamu: *See*—
Fujii, Tetsuya; Oguchi, Yukio; Sumita, Norio; and Goto, Isamu, 4,405,295, Cl. 419-28.000.
Goto, Norio, to Hitachi, Ltd.; Hitachi Metals, Ltd.; and Research Development Cooperation of Japan. Frost sensor. 4,404,852, Cl. 73-599.000.
Gotoh, Katsuhiko: *See*—
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Borgarello, Enrico; and Pelizzetti, Ezio, to Graetzel, Michael. Method for producing hydrogen and elemental sulphur by photochemical oxidation-reduction of hydrogen sulphide and metal sulphides. 4,405,424, Cl. 204-157.10R.
Grantham, Daniel H.: *See*—
Swindal, James L.; and Grantham, Daniel H., 4,405,970, Cl. 361-283.000.
Grass, Hansjorg; and Zell, Reinhard, to Hoffmann- La Roche Inc. Process for the manufacture of cyclohexene derivatives. 4,405,417, Cl. 204-73.00R.
Grau, Thomas G., to Bell Telephone Laboratories, Incorporated. Photo-electric apparatus for testing electrical connector contacts. 4,405,233, Cl. 356-237.000.
Gravity Guidance, Inc.: *See*—
Miller, Jack V., 4,405,127, Cl. 272-62.000.
Gray, Jack, to United States of America, Army. GSP/Doppler sensor velocity derived attitude reference system. 4,405,986, Cl. 364-434.000.
Gray, James W. Adaptor for disposable cans for siphon-type spray paint guns. 4,405,088, Cl. 239-302.000.
Gray, Robert D. Dehydrated fish concentrate and process for same. 4,405,653, Cl. 426-643.000.
Gray, Thomas J., to Olin Corporation. Raney alloy coated cathode for chlor-alkali cells. 4,405,434, Cl. 204-293.000.
Greatbatch Enterprises, Inc.: *See*—
Greatbatch, Wilson, 4,405,311, Cl. 604-20.000.
Greatbatch, Wilson, to Greatbatch Enterprises, Inc. Method and apparatus for direct electrical injection of gold ions into tissue such as bone. 4,405,311, Cl. 604-20.000.
Green, Leonard O. Pre-coiled cable-lock device. 4,404,822, Cl. 70-233.000.
Green, Michael J.: *See*—
Blythin, David; and Green, Michael J., 4,405,810, Cl. 562-495.000.
Greening, Nathan R.: *See*—
Serafin, Frank G.; Previte, Robert W.; Greening, Nathan R.; Kantro, David L.; and Tang, Fulvio J., 4,405,372, Cl. 106-90.000.
Greer, Marian B. Method for the production of a composite material. 4,405,542, Cl. 264-109.000.
Greinecker, Herbert; and Stern, Gerhard, to Chemie Linz Aktiengesellschaft. Filler for paper, card or board, a process for its manufacture, and paper, card or board containing the filler. 4,405,744, Cl. 524-423.000.
Greubel, Waldemar: *See*—
Baur, Guenter; Greubel, Waldemar; Krueger, Hans; and Schauer, Alois, 4,405,210, Cl. 350-345.000.
Griessbaum, Karl: *See*—
Frohlich, Alfons; and Griessbaum, Karl, 4,404,998, Cl. 139-384.00B.
Griffis, Patrick D., to RCA Corporation. Volume control signal coupling circuit in an audio signal processing system. 4,405,948, Cl. 358-198.000.
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., to Republic Steel Corporation. High strength, low alloy steel with improved surface and mechanical properties. 4,405,380, Cl. 148-2.000.
Grigo, Ulrich: *See*—
Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahnler, Friedrich; and Brassat, Bert, 4,405,748, Cl. 524-504.000.
Grinnell Fire Protection Systems Company, Inc.: *See*—
Fischer, Michael A., 4,405,018, Cl. 169-37.000.
Grisar, J. Martin: *See*—
Dage, Richard C.; Palopoli, Frank P.; Schnettler, Richard A.; and Grisar, J. Martin, 4,405,628, Cl. 424-263.000.
Grisar, Johann M.: *See*—
Schnettler, Richard A.; Dage, Richard C.; and Grisar, Johann M., 4,405,635, Cl. 424-273.00R.
Grobman, Warren D.; Nelson, David A., Jr.; and Warlaumont, John M., to International Business Machines Corporation. Alignment method and apparatus for x-ray or optical lithography. 4,405,238, Cl. 356-401.000.
Grody, Donald R.: *See*—
Frye, Kenneth G.; Grody, Donald R.; and Guild, Gerald A., 4,405,126, Cl. 271-279.000.
Groff, James W. Timed telephone ring silencer device. 4,405,839, Cl. 179-84.00C.
Grogler, Gerhard: *See*—
Recker, Klaus; Reinecke, Gerd; Awater, Albert; Grogler, Gerhard; and Kraft, Karl J., 4,405,752, Cl. 524-847.000.
Grosbois, Jean; and Dumousseau, Jean-Yves, to Rhone-Poulenc Specialites Chimiques. Hydrogenation of chlorosilanes to silane, SiH_4, in bath of molten salts. 4,405,591, Cl. 423-347.000.
Gross, James R.; and Larkin, Mark E., to Abbott Laboratories. Connecting device for medical liquid containers. 4,405,312, Cl. 604-29.000.
Groupement d'Interet Economic dit: Centre International de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,405,615, Cl. 424-232.000.
Grubert, Klaus: *See*—
Ruhnau, Gerhard; Grubert, Klaus; Hesse, Karl-Heinz; and Auding, Rudolf, 4,405,982, Cl. 364-200.000.
Grundfos Pumpenfabrik GmbH: *See*—
Jensen, Niels D.; and Johansen, Arne, 4,404,729, Cl. 29-568.000.
Grunewalder, John F.: *See*—
Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., 4,405,428, Cl. 204-181.00R.
GTE Automatic Electric Incorporated: *See*—
Blackburn, Tom L., 4,405,903, Cl. 330-284.000.
Lender, Adam, 4,406,009, Cl. 375-18.000.
GTE Automatic Electric Labs Inc.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., 4,406,005, Cl. 370-63.000.
GTE Products Corporation: *See*—
Belttary, Harold E., 4,405,846, Cl. 200-144.00R.
Goebel, Franz; and Kealey, Kathleen M., 4,405,694, Cl. 429-101.000.
Haraden, Thomas; and Hough, Harold L., 4,405,877, Cl. 313-318.000.
Overstreet, Scott M.; and Swenson, C. Henning, 4,405,889, Cl. 320-1.000.
Overstreet, Scott M.; and Swenson, C. Henning, 4,405,975, Cl. 363-49.000.
Yale, Ramon L., 4,405,691, Cl. 428-690.000.
Guardiola, Agustin D. Apparatus for handling and weighing fruits and the like. 4,405,023, Cl. 177-59.000.
Guild, Gerald A.: *See*—
Frye, Kenneth G.; Grody, Donald R.; and Guild, Gerald A., 4,405,126, Cl. 271-279.000.
Guiley, Clifford D., Jr.: *See*—
Murphy, Walter T.; and Guiley, Clifford D., Jr., 4,405,817, Cl. 568-701.000.
Guisinger, Barrett E., to Sony Corporation. Radio frequency equalizer. 4,405,954, Cl. 360-65.000.
Gulf Oil Corporation: *See*—
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,405,791, Cl. 546-316.000.
Gullo, James M.: *See*—
Heilman, William P.; and Gullo, James M., 4,405,619, Cl. 424-249.000.
Gulton Industries, Inc.: *See*—
Rance, John E., 4,405,893, Cl. 323-271.000.
Guntulis, Raymond S.: *See*—
Sadanandan, Kunissey P.; and Guntulis, Raymond S., 4,404,875, Cl. 81-53.200.

Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., to Firestone Tire & Rubber Company, The. Methods for storage of guayule plant material. 4,405,532, Cl. 260-816.00R.

Guttler, Hermann: *See*—
Wolf, Horst; and Guttler, Hermann, 4,404,791, Cl. 57-80.000.

Guttmann, Friedrich W., to Klockner-Humboldt-Deutz AG. Method and device for generating a convective reaction system between a reaction agent and a molten bath. 4,405,366, Cl. 75-93.00E.

Gwyn, John E., to Shell Oil Company. Process for maintaining the temperature of a steam-making effluent above the dew point. 4,405,440, Cl. 208-48.00Q.

H. L. Blachford Ltd/Ltee: *See*—
Blachford, John, 4,404,828, Cl. 72-42.000.

Haacke, Claus: *See*—
Voges, Karl-Friedrich; Haacke, Claus; and Heise, Peter, 4,405,163, Cl. 285-305.000.

Haantera, Antti: *See*—
Koskivirta, Veikko; and Haantera, Antti, 4,405,259, Cl. 405-62.000.

Haemonetics Corporation: *See*—
Schoendorfer, Donald W., 4,405,079, Cl. 494-1.000.

Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, to Consortium fur Elektrochemische Ind. GmbH. Greases prepared from organosiloxanes with SiC-bonded groups. 4,405,469, Cl. 252-28.000.

Hager, Markus. Convertible outerwear and carrying bag. 4,404,687, Cl. 2-94.000.

Hagg, Rune; and Lundstrom, Lennart, to ASEA Aktiebolag. Method for mounting a winding in a transformer. 4,404,740, Cl. 29-606.000.

Hagiwara, Miyuki: *See*—
Hosoi, Fumio; Sasaki, Takashi; and Hagiwara, Miyuki, 4,405,426, Cl. 204-159.150.

Hahn, Frecerick C.; Barber, William R., Jr.; and Hampel, David A., to Esco Corporation. Excavating tooth. 4,404,760, Cl. 37-142.00R.

Hahn, Kurt L.: *See*—
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,404,837, Cl. 72-349.000.

Hakli, Reijo S., to Lannen Tehtaat Oy. Method and device for planting plants. 4,404,917, Cl. 111-3.000.

Hakozaki, Susumu: *See*—
Nakajima, Kazuhisa; Miyashita, Masahiko; Hakozaki, Susumu; and Chosakon, Yoshinori, 4,405,808, Cl. 560-247.000.

Hall, Douglas D., to Armco Inc. Underwater devices with remotely operated latch means. 4,405,263, Cl. 405-224.000.

Hall, Eldon C.; Seward, Harold H.; Sabo, Joseph D.; De Marco, Vincent R.; and Prisant, Millard B., to United States of America, Navy. Guidance computer. 4,405,985, Cl. 364-423.000.

Hall, Henry K.; and Wilson, Donald R., to Celanese Corporation. Acrylate and methacrylate monoesters of pentaerythritol and pentaerythritol orthoesters and polymers and copolymers derived therefrom. 4,405,798, Cl. 549-363.000.

Hall, Jay D.; Stump, Theodore M.; and Thode, Charles W., to Anaconda-Ericsson, Inc. Ring scheduling apparatus for a digital multiplexed telecommunication system. 4,406,004, Cl. 370-15.000.

Hamilton Stands, Incorporated: *See*—
Clyburn, C. Wayne, 4,405,107, Cl. 248-122.000.

Hammann, Ingeborg: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.

Hampel, David A.: *See*—
Hahn, Frecerick C.; Barber, William R., Jr.; and Hampel, David A., 4,404,760, Cl. 37-142.00R.

Handt, Alan E., to Ash, Stephen R., a part interest. Spike exchanger for continuous ambulatory peritoneal dialysis. 4,405,315, Cl. 604-80.000.

Hanifl, Paul H., to Sage Products, Inc. Needle and syringe destructor. 4,404,881, Cl. 83-167.000.

Hanna, John W. Clip-on compass. 4,404,752, Cl. 33-347.000.

Hanna, Samuel Y., to Centronics Data Computer Corp. Fully self-contained disposable cartridge for inked ribbons and the like. 4,405,247, Cl. 400-196.100.

Hanover, Barry K.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,405,305, Cl. 604-49.000.

Hansen, David R., to Shell Oil Company. Roofing shingle. 4,405,680, Cl. 428-285.000.

Hansen, Guenter: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,405,330, Cl. 8-639.000.

Hansen, Willi; Kunze, Bernard; and Hermanns, Matthias, to Wilhelm Hegenscheidt Gesellshaft mbH. Deep drilling machine. 4,405,266, Cl. 408-56.000.

Hanulik, Jozef, to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule. Remotely operable sample-taking appliance, especially for ascertaining radio activity profiles in contaminated material surfaces. 4,405,430, Cl. 204-400.000.

Hara, Hiroshi: *See*—
Tamura, Takeo; Hara, Hiroshi; and Kido, Takayoshi, 4,405,887, Cl. 318-443.000.

Haraden, Thomas; and Hough, Harold L., to GTE Products Corporation. Variably positional lamp holder assembly. 4,405,877, Cl. 313-318.000.

Hardison, Leslie C.; and Sandstrom, Kenneth A., to National Seal Company. Seam tester. 4,404,857, Cl. 73-827.000.

Hare, Charles E. System for straightening bent automobile bodies. 4,404,838, Cl. 72-457.000.

Hargrove, John D.: *See*—
Barclay, John L.; Hargrove, John D.; and Prince, Richard J., 4,405,503, Cl. 252-455.00Z.

Harke, Hans-Peter: *See*—
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 549-417.000.

Harnden, Robert M.; and Baugh, Daniel W., Jr., to Dow Chemical Company, The. Preparation of 2-oxazolidinone and ethyleneurea. 4,405,794, Cl. 548-229.000.

Harrah, Larry A.; Mead, Keith E.; and Smith, Henry M. Combination moisture and hydrogen getter. 4,405,487, Cl. 252-194.000.

Harris Corporation: *See*—
Ehlbernd, Gerald F., 4,405,928, Cl. 343-912.000.
Kanaly, David B., 4,405,943, Cl. 358-133.000.

Harris, Rano J., Sr., to Dynatech Precision Sampling Corporation. Microdispensing springs with a needle in a tubular extension. 4,404,862, Cl. 73-864.160.

Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compositions with pleochroic anthraquinone dyes. 4,405,211, Cl. 350-349.000.

Harrow, Jeffrey J.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,405,305, Cl. 604-49.000.

Harsco Corporation: *See*—
Doubleday, Max; and Gallis, Anthony J., 4,405,112, Cl. 249-207.000.

Harshaw Chemical Company, The: *See*—
Skimin, Carol W., 4,405,413, Cl. 204-55.00R.

Hart, Granville S.: *See*—
Brandewie, Joseph E.; and Hart, Granville S., 4,404,743, Cl. 29-857.000.

Hart, James E., to American Standard Inc. Control valve arrangement for combined brake cylinder and air reservoir device. 4,405,182, Cl. 303-23.00R.

Hartman, Lawrence. Headrest for a chiropractic device. 4,404,966, Cl. 128-69.000.

Hartman, Stanley M.: *See*—
Rice, Richard M.; and Hartman, Stanley M., 4,405,894, Cl. 323-340.000.

Hartmann, Peter J.: *See*—
Turbak, Albin F.; and Hartmann, Peter J., 4,405,549, Cl. 264-188.000.

Hartshorn, Frank; Murphy, Brian J. M.; and Storer, Richard E., to USM Corporation. Shoe support. 4,404,701, Cl. 12-127.000.

Haruta, Masao, to Sony Corporation. Cassette loading and unloading apparatus. 4,405,962, Cl. 360-96.600.

Harvey Hubbell Incorporated: *See*—
Quiogue, Honesto D., 4,405,974, Cl. 362-362.000.

Harvey, William: *See*—
Lancaster, Jack; Floyd, John; and Harvey, William, 4,404,973, Cl. 128-654.000.

Hasebe, Tsutomu: *See*—
Saitoh, Tatsuo; and Hasebe, Tsutomu, 4,405,274, Cl. 411-249.000.

Hasegawa, Eiichi: *See*—
Takahashi, Yonosuke; Wada, Minoru; and Hasegawa, Eiichi, 4,405,706, Cl. 430-271.000.

Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, to Fujitsu Limited. Electromagnetic relay. 4,405,911, Cl. 335-202.000.

Hasegawa, Tsunao: *See*—
Inomata, Akira; Hasegawa, Tsunao; and Ohtake, Yasushi, 4,405,953, Cl. 360-65.000.

Hasenauer, Dieter: *See*—
Fischer, Wilfried; and Hasenauer, Dieter, 4,405,696, Cl. 429-104.000.

Hasenclever, Kaspar D., to Chemische Fabrik Kreussler & Co. GmbH. Cleaning intensifier for use in dry-cleaning machines equipped with adsorption filters. 4,405,511, Cl. 252-547.000.

Hashem, Mohamed M.: *See*—
Chakrabarti, Paritosh M.; Hashem, Mohamed M.; and Cheng, Tom M. H., 4,405,799, Cl. 549-369.000.

Hashimoto, Fukashi, to Mitsubishi Petrochemical Company Limited. Biaxially oriented polypropylene film and method for its production. 4,405,775, Cl. 526-351.000.

Hashimoto, Katukuni: *See*—
Otoguro, Yasuo; Hashimoto, Katukuni; Takahashi, Hisashi; and Fujita, Toshio, 4,405,369, Cl. 75-126.00C.

Hashimoto, Kinro: *See*—
Oyama, Motofumi; and Hashimoto, Kinro, 4,405,756, Cl. 525-237.000.

Haskel, Incorporated: *See*—
Bixby, Willard W., Jr.; and Christopher, Jerry, 4,405,292, Cl. 417-403.000.

Hasui, Hiroshi; Furihata, Toshikazu; Takanashi, Kazuko; and Ohmori, Masahiko, to Mitsui Petrochemical Industries, Ltd. Tetrakis[3-(3,5-di-t-butyl-4-hydroxyphenyl)propionyloxymethyl]methane having a novel crystal structure and process for production thereof. 4,405,807, Cl. 560-75.000.

Hatakeyama, Yasuyuki: *See*—
Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.

Hatanaka, Katsunori: *See*—
Hirai, Yutaka; Hatanaka, Katsunori; Ayata, Naoki; and Uzawa, Shunichi, 4,405,857, Cl. 250-211.00J.
Hatcher, Frank L., to Intermatic Incorporated. Remote control system for spas. 4,404,697, Cl. 4-492.000.
Hatco Corporation: *See*—
Chaudoir, Roderick J., 4,404,898, Cl. 99-331.000.
Haun, R. P., Jr. Placid shale weighting agent for water base drilling mud. 4,405,468, Cl. 252-8.50B.
Hauser, Kurt, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG. Fluid friction clutch. 4,405,039, Cl. 192-58.00B.
Hauserman Ltd.: *See*—
Ball, Douglas C.; Stumpf, William S.; and Ludwig, Gary R., 4,404,776, Cl. 52-29.000.
Havens, Donald P.: *See*—
Johnson, Robert A.; and Havens, Donald P., 4,405,909, Cl. 333-198.000.
Hayashi, Hiroshi: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,405,467, Cl. 252-1.000.
Hayashi, Shigekazu: *See*—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Ukita, Michito; Nakagawa, Hideaki; and Matsuura, Mitsuyuki, 4,405,774, Cl. 526-348.200.
Hayes, John T.: *See*—
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,703, Cl. 15-230.110.
Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., 4,404,999, Cl. 139-391.000.
Hayes, Russell A.; and Duve, Gerard, to Richardson-Vicks Pty. Limited. Sanitizing formulation. 4,405,482, Cl. 252-99.000.
Hazelwood, Geoffrey, to Baker Perkins Holdings Limited. Density control system for tea packaging apparatus. 4,404,787, Cl. 53-502.000.
Hazelwood, Neil: *See*—
Cave, Ellis K.; and Hazelwood, Neil, 4,405,833, Cl. 179-1.0MN.
Hazlett, Effie Hoopman: *See*—
Hazlett, Robert L., 4,405,008, Cl. 160-213.000.
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Hecht, Sidney M. Biologically active extracts from *Maytenus nemerosa* (Eckl and Zeyh) Morais (Celastraceae) South Africa and method of obtaining same. 4,405,613, Cl. 424-195.000.
Hedler, Robert A.: *See*—
Gallaro, Anthony V.; and Hedler, Robert A., 4,405,880, Cl. 313-467.000.
Hedrich, Loren W.: *See*—
Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., 4,405,791, Cl. 546-316.000.
Hegler, Roy E., to Knopik, Duane L. Leak detecting method. 4,404,844, Cl. 73-49.200.
Heilman, William P.; and Gullo, James M., to Diamond Shamrock Corporation. Antiinflammatory substituted-1,2,4-triazolo[4,3-b]-1,2,4-triazines. 4,405,619, Cl. 424-249.000.
Heimburger, Norbert: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Wormsbacher, Wilfried, 4,405,603, Cl. 424-101.000.
Heimen, Jochen, to Siemens Aktiengesellschaft. Method of producing luminescent or laser diodes having an internally limited luminescent surface. 4,404,730, Cl. 29-569.90L.
Heinrich, Hans-Otto: *See*—
Bahr, Theodor; Heinrich, Hans-Otto; and Thumm, Helmut, 4,405,091, Cl. 241-33.000.
Heinze, Walter O.; Tufts, Wesley M.; and White, Jeffrey F., to International Water Saving Systems, Inc. Fluid velocity assist. 4,404,696, Cl. 4-420.000.
Heise, Peter: *See*—
Voges, Karl-Friedrich; Haacke, Claus; and Heise, Peter, 4,405,163, Cl. 285-305.000.
Helbig, Joachim W.; and Kopp, Klaus F. Pharmaceutical preparations for and treatment procedures involving increasing plasma bicarbonate level. 4,405,596, Cl. 424-33.000.
Helix Technology Corporation: *See*—
Andeen, Bruce R., 4,404,808, Cl. 62-6.000.
Henderson, Albert E. Method of defluorinating phosphates. 4,405,575, Cl. 423-167.000.
Henderson, Robert M.: *See*—
Zechlin, Richard; and Henderson, Robert M., 4,404,951, Cl. 123-595.000.
Henke, Donald L.: *See*—
Buschbom, Floyd E.; and Henke, Donald L., 4,405,040, Cl. 192-67.00R.
Hennessy, Thomas F., to Lori Corporation. Side-bar lock. 4,404,824, Cl. 70-364.00A.
Herbort, Hans-Joachim; and Schuster, Heinz G., to Uhde GmbH. Tubular reaction furnace for indirect heating of crackable fluids. 4,405,564, Cl. 422-197.000.
Herbort, Hans-Joachim; and Schuster, Heinz G., to UHDE GmbH. Tubular reaction furnace for indirect heating of crackable fluids. 4,405,565, Cl. 422-197.000.
Hercules Incorporated: *See*—
Earl, Robert A.; and Elmslie, James S., 4,405,762, Cl. 525-410.000.
Hermann Werner GmbH & Co., Firma: *See*—
Lieser, Karl, 4,404,874, Cl. 81-438.000.
Hermanns, Matthias: *See*—
Hansen, Willi; Kunze, Bernard; and Hermanns, Matthias, 4,405,266, Cl. 408-56.000.
Hertzler, Bruce. Cartridge case refinishing set. 4,405,269, Cl. 408-211.000.
Hesler, Benjamin F.: *See*—
Mount, Gordon L.; and Hesler, Benjamin F., 4,404,811, Cl. 62-84.000.
Hess, Bruno M. Process control computer wherein data and addresses are separately processed. 4,405,980, Cl. 364-200.000.
Hesse, Karl-Heinz: *See*—
Ruhnau, Gerhard; Grubert, Klaus; Hesse, Karl-Heinz; and Auding, Rudolf, 4,405,982, Cl. 364-200.000.
Hewlett-Packard Company: *See*—
Hornak, Thomas; and Baldwin, Gary L., 4,405,916, Cl. 340-347.0DA.
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., Jr., 4,405,993, Cl. 365-108.000.
Hewlett-Packard GmbH: *See*—
Schrenker, Helge, 4,404,845, Cl. 73-61.10C.
Hickman, Robert O.: *See*—
Sisley, James R.; and Hickman, Robert O., 4,405,313, Cl. 604-43.000.
Hickmann, Horst R. Aneurysm clip testing instrument. 4,404,850, Cl. 73-161.000.
Hicks, Wilford L., Jr. Rechargeable glow plug energizer. 4,405,890, Cl. 320-2.000.
Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Magnetic reproducing apparatus with magnetoresistive head. 4,405,958, Cl. 360-113.000.
Hild, Berthold; Braun, Martin; and Munker, Max, to SMS Schloemann-Siemag Aktiengesellschaft. Strip-guide assembly for a metal strip coiler. 4,404,831, Cl. 72-148.000.
Hilfman, Lee; and Gatsis, John G., to UOP Inc. Method for the removal of metal from a hydrocarbon solution containing metal alkaryl sulfonate. 4,405,447, Cl. 208-251.00R.
Hill, James. Cutting and collating sheets of paper, card, etc. 4,405,121, Cl. 270-58.000.
Hillard, Randy H.: *See*—
Paulin, Stephen V.; Hillard, Randy H.; and Youngers, Stephen A., 4,404,761, Cl. 37-191.00A.
Hilti Aktiengesellschaft: *See*—
Kindle, Edwin; and Jochum, Peter, 4,405,072, Cl. 227-10.000.
Oesterle, Helmut, 4,404,894, Cl. 91-461.000.
Hirai, Bunji; Kubota, Naohiro; and Sugibuchi, Kazuo, to Adeka Argus Chemical Co., Ltd. N-2-Hydroxypropyl piperidines and compositions thereof. 4,405,737, Cl. 524-102.000.
Hirai, Yutaka; Hatanaka, Katsunori; Ayata, Naoki; and Uzawa, Shunichi, to Canon Kabushiki Kaisha. Solid-state photoelectric converter. 4,405,857, Cl. 250-211.00J.
Hiramoto, Akira: *See*—
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.
Hirata, Suekazu: *See*—
Nakaya, Keiichi; Kawanami, Kohji; and Hirata, Suekazu, 4,405,592, Cl. 423-421.000.
Hirota, Tetsuya: *See*—
Ando, Masao; Hirota, Tetsuya; and Shioda, Katashi, 4,405,455, Cl. 210-191.000.
Hirsch, Bodo; Horn, Gunter; and Reuther, Hellmut, to VEB Chemiewerk Nunchritz. Silicon-containing nitro dyes and process for making the same. 4,405,801, Cl. 556-422.000.
Hirschberg, Eugene H.: *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,405,443, Cl. 208-113.000.
Hisajima, Masahiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, 4,405,226, Cl. 355-14.00D.
Hitachi Koki Company, Limited: *See*—
Nishino, Shinichi; Katagiri, Shigenobu; and Kubo, Kazuyuki, 4,405,922, Cl. 340-825.360.
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.
Hitachi, Ltd.: *See*—
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, 4,405,879, Cl. 313-386.000.
Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, 4,405,935, Cl. 357-31.000.
Goto, Norio, 4,404,852, Cl. 73-599.000.
Ishii, Kiyoichi; Fujii, Hideharu; and Kobayashi, Kenji, 4,405,932, Cl. 357-13.000.
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,405,242, Cl. 368-82.000.
Kudo, Mitsuru; and Nakagawa, Isao, 4,405,937, Cl. 358-40.000.
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Kogi; and Suzuki, Mitsuo, 4,405,923, Cl. 340-825.560.
Nakamura, Ichiro; Takenoshita, Mitsuaki; Ichiryu, Ken; Akasaka, Yoshimichi; and Watanabe, Haruo, 4,404,892, Cl. 91-396.000.
Nobutoki, Saburo, 4,405,938, Cl. 358-44.000.
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, 4,404,846, Cl. 73-118.000.

Hitachi Metals, Ltd.: *See*—
Goto, Norio, 4,404,852, Cl. 73-599.000.

Hitachi Microcomputer Engineering, Ltd.: *See*—
Ishii, Kiyoichi; Fujii, Hideharu; and Kobayashi, Kenji, 4,405,932, Cl. 357-13.000.

Hoard, John W.; and Tuttle, Richard R., to Ford Motor Company. Method for improving fuel control in an internal combustion engine. 4,404,946, Cl. 123-486.000.

Hobbs, John F.; and Sutcliffe, Gordon R., to Imperial Metal Industries (Kynoch) Limited. Method of making priming composition. 4,405,392, Cl. 149-109.600.

Hobbs, Larry R. Apparatus for cleaning the bore of a flintlock muzzleloading rifle. 4,404,979, Cl. 134-166.00C.

Hochtemperatur-Reaktorbau GmbH: *See*—
Koerdt, Reinhold; Schoening, Josef; and Schwiers, Hans-Georg, 4,405,055, Cl. 220-215.000.

Hockenbrock, Richard L.; and Strauss, Paul, to Zenith Radio Corporation. Liquid cooling in projection cathode ray tubes. 4,405,949, Cl. 358-237.000.

Hodges, Everett L. Method for hydraulically mining unconsolidated subterranean mineral formations using remote support. 4,405,176, Cl. 299-17.000.

Hoechst Aktiengesellschaft: *See*—
Bayerle, Armin; Holz, Karl-Heinz; Luke, Johannes; and Riederer, Wolfgang, 4,404,957, Cl. 126-419.000.
Berthold, Rudiger; and Muller, Werner H., 4,405,813, Cl. 564-415.000.
Disselbeck, Dieter; and Speier, Klaus, 4,405,460, Cl. 210-640.000.
Ehmann, Werner; and Rinno, Helmut, 4,405,747, Cl. 524-503.000.
Fuchs, Otto; Kroh, Adolf; and Teige, Wolfgang, 4,405,734, Cl. 524-90.000.
Fuchs, Otto; Hunger, Klaus; Weber, Dieter; and Zunker, Reinhard, 4,405,793, Cl. 548-131.000.
Skaletz, Detlef H., 4,405,816, Cl. 568-592.000.
Wiezer, Hartmut; Pfahler, Gerhard; and Korbanka, Helmut, 4,405,735, Cl. 524-95.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,405,631, Cl. 424-267.000.

Hoffmann, Elmar, to M.A.N. Maschinenfabrik Augsburg-Nurnberg GmbH. Resilient sealing frame for the front and rear windows of a vehicle. 4,405,175, Cl. 296-201.000.

Hoffmann, Hartmut; and Baron, Klaus U., to Teldix GmbH. Releasable coupling for connecting at least two light waveguides. 4,405,200, Cl. 350-96.210.

Hoffmann-La Roche Inc.: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,405,518, Cl. 260-245.700.
Fujiwara, Akiko; and Hoshino, Tatsuo, 4,405,713, Cl. 435-78.000.
Grass, Hansjorg; and Zell, Reinhard, 4,405,417, Cl. 204-73.00R.
Hunkeler, Walter; and Kyburz, Emilio, 4,405,516, Cl. 260-239.30B.
Hunkeler, Walter; and Kyburz, Emilio, 4,405,517, Cl. 260-239.30T.

Hohmann, Gerhard: *See*—
Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, 4,405,742, Cl. 524-315.000.

Hokko Chemical Industry Co., Ltd.: *See*—
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.

Holcombe, Ricardo I.: *See*—
Caballero, Alejandro J.; and Holcombe, Ricardo I., 4,405,588, Cl. 423-340.000.

Holdt, Dietmar: *See*—
Pfeifer, Alfred; Seif, Rudolf; and Holdt, Dietmar, 4,405,431, Cl. 204-202.000.

Holmes, Lawrence, Jr. Typewriter operating attachment providing for dead key operations. 4,405,244, Cl. 400-66.000.

Holtey, Thomas O.; Noyes, Steven S.; and Raymond, James C., to Honeywell Information Systems Inc. Data processing system having apparatus in a communications subsystem for establishing byte synchronization. 4,405,979, Cl. 364-200.000.

Holtzman, Barry L., to Westinghouse Electric Corp. Capacitor apparatus with an individual discharge damping device for each capacitor unit. 4,405,963, Cl. 361-16.000.

Holz, Karl-Heinz: *See*—
Bayerle, Armin; Holz, Karl-Heinz; Luke, Johannes; and Riederer, Wolfgang, 4,404,957, Cl. 126-419.000.

Hombak Maschinenfabrik GmbH U. Co. KG: *See*—
Sybertz, Hans; Sybertz, Ferdinand; and Schmidt, Arnold, 4,405,092, Cl. 241-294.000.

Homeyer, Bernhard: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, 4,404,934, Cl. 123-190.0BD.
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,405,027, Cl. 180-56.000.
Mitsuhashi, Yoshinobu; Shimada, Junichi; Sakurai, Kenjiro; and Nakamura, Yukinobu, 4,405,236, Cl. 356-350.000.

Honda, Harukichi; Kawada, Toshiya; and Tsujitsugu, Yoshiyuki, to Kyowa Electronic Instruments Co., Ltd. Strain measuring device. 4,404,856, Cl. 73-765.000.

Honeywell Inc.: *See*—
Chai, Thomas Y., 4,405,917, Cl. 340-365.00C.
Doddapaneni, Narayan, 4,405,693, Cl. 429-101.000.
Kompelien, Arlon D., 4,405,080, Cl. 236-78.00D.
Serber, Stephen L., 4,405,299, Cl. 431-78.000.

Honeywell Information Systems Inc.: *See*—
Holtey, Thomas O.; Noyes, Steven S.; and Raymond, James C., 4,405,979, Cl. 364-200.000.
Lange, Ronald E.; and King, Steve E., 4,405,978, Cl. 364-200.000.
Yu, Kin C.; and Kachemov, Angelo D., 4,405,981, Cl. 364-200.000.

Honig, Helmar: *See*—
Muller, Hans J.; Honig, Helmar; and Horlitz, Werner, 4,405,500, Cl. 252-433.000.

Honjo, Kuniaki; and Shindo, Akio, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Carbon fibers with duplex metal carbide coating and methods for manufacture thereof. 4,405,685, Cl. 428-368.000.

Hontz, Thomas D.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; Reeder, Kevin J.; and Hontz, Thomas D., 4,404,698, Cl. 5-507.000.

Hoobler, Mary A.: *See*—
Sikorski, James A.; and Hoobler, Mary A., 4,405,356, Cl. 71-87.000.

Hoover Company, The: *See*—
Tschudy, Donald B.; and Lorson, Emmett D., 4,405,346, Cl. 55-357.000.

Hope Plastics Corporation: *See*—
Frederick, David C., 4,404,790, Cl. 57-12.000.

Horii, Juichi; Nakajima, Shuichi; and Takahashi, Eiji, to Horii Toshado Kabushiki Kaisha. Rotary duplicating machine with automatic stencil paper discharge. 4,404,902, Cl. 101-122.000.

Horii Toshado Kabushiki Kaisha: *See*—
Horii, Juichi; Nakajima, Shuichi; and Takahashi, Eiji, 4,404,902, Cl. 101-122.000.

Horino, Shigeo: *See*—
Ohba, Hiroshi; and Horino, Shigeo, 4,404,723, Cl. 29-33.520.

Horlitz, Werner: *See*—
Muller, Hans J.; Honig, Helmar; and Horlitz, Werner, 4,405,500, Cl. 252-433.000.

Horn, Gunter: *See*—
Hirsch, Bodo; Horn, Gunter; and Reuther, Hellmut, 4,405,801, Cl. 556-422.000.

Hornak, Thomas; and Baldwin, Gary L., to Hewlett-Packard Company. Digital-to analog converter having supplementary currents to enhance low current switching speed. 4,405,916, Cl. 340-347.0DA.

Horsman, John; and Ryden, James W., to U-Haul Technical Center. Trailer steering device for spaced axle trailer. 4,405,147, Cl. 280-443.000.

Horvath, Tibor. Puzzle cube. 4,405,131, Cl. 273-153.00S.

Hoshi, Noboru: *See*—
Takagishi, Yasushi; Doi, Yoshio; Ohsuga, Kiichiro; Hoshi, Noboru; and Shionogi & Co., Ltd., 4,405,597, Cl. 424-35.000.

Hoshino, Kazuo; Tanaka, Teruo; and Tachibana, Keiichi, to Nisshin Steel Company, Ltd. High strength stainless steel having excellent intergranular corrosion cracking resistance and workability. 4,405,390, Cl. 148-37.000.

Hoshino, Tatsuo: *See*—
Fujiwara, Akiko; and Hoshino, Tatsuo, 4,405,713, Cl. 435-78.000.

Hosoda, Norihide: *See*—
Kuraoka, Yasuo; and Hosoda, Norihide, 4,405,243, Cl. 374-46.000.

Hosoi, Fumio; Sasaki, Takashi; and Hagiwara, Miyuki, to Japan Atomic Energy Research Institute. Self-curing irradiated blend of epoxy resin and salt of quaternary amino ester of unsaturated acid. 4,405,426, Cl. 204-159.150.

Hosokawa, Etsuo: *See*—
Morita, Minoru; Hosokawa, Etsuo; and Arahara, Kuhzuh, 4,405,687, Cl. 428-383.000.

Hosoya, Akira: *See*—
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.

Hough, Harold L.: *See*—
Haraden, Thomas; and Hough, Harold L., 4,405,877, Cl. 313-318.000.

Howard, Edward G., Jr.; and Marsh, Frank D., to Du Pont de Nemours, E. I., and Company. Chlorination and crosslinking of selected polymers with Cl_2O or HOCl. 4,405,760, Cl. 525-383.000.

Howell, Bobby A.; and Walles, Erik W. Macromolecular complexes of amidocarbonylic water-soluble polymers and square planar platinous and equivalent organometallics. 4,405,757, Cl. 525-326.900.

Howmedica International Inc.: *See*—
Buning, Onno; and Lawes, Peter, 4,404,691, Cl. 3-1.911.

Hoxan Corporation: *See*—
Kuraoka, Yasuo; and Hosoda, Norihide, 4,405,243, Cl. 374-46.000.

Hsei, Paul K., to American Hospital Supply Corporation. Tablet dispensing device. 4,405,060, Cl. 221-135.000.

Hsu, Chao-Yang, to Sun Tech. Inc. Hydroformylation catalyst and process of using it. 4,405,496, Cl. 252-429.00R.

Hu, Paul Y.: *See*—
Chow, William W.; Fields, Davis S., Jr.; Hu, Paul Y.; and Lopez, Jorge L., 4,405,961, Cl. 360-129.000.

Huberman, Richard. Air filler adapter. 4,405,158, Cl. 285-7.000.

Huck Manufacturing Company: *See*—
Ruhl, John H.; and Dixon, Richard D., 4,405,273, Cl. 411-43.000.
Hudson, John L.: *See*—
Elliott, Lloyd E., Jr.; and Hudson, John L., 4,405,033, Cl. 181-120.06.
Huff, James F.: *See*—
Werner, Kenneth R.; and Huff, James F., 4,405,036, Cl. 181-110.000.
Hugelshofer, Paul: *See*—
Abel, Heinz; and Hugelshofer, Paul, 4,405,329, Cl. 8-527.000.
Huggins, Robert A.: *See*—
Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A., 4,405,416, Cl. 204-68.000.
Hughes Aircraft Company: *See*—
Reinsch, Stephen J., 4,405,882, Cl. 315-118.000.
Yamagishi, Frederick G., 4,405,692, Cl. 428-696.000.
Huguenin, Rene: *See*—
Cardinaux, Francois; Huguenin, Rene; and Pless, Janos, 4,405,607, Cl. 424-177.000.
Hultsch, Gunther; Alstetter, Franz; and Breuer, Uwe, to Krauss-Maffei Aktiengesellschaft. Process and apparatus for the dewatering of solids in suspension. 4,405,454, Cl. 209-279.000.
Hunger, Klaus: *See*—
Fuchs, Otto; Hunger, Klaus; Weber, Dieter; and Zunker, Reinhard, 4,405,793, Cl. 548-131.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Manufacture of polyimide film by solvent casting. 4,405,550, Cl. 264-216.000.
Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,405,516, Cl. 260-239.30B.
Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Azeto-diazepines. 4,405,517, Cl. 260-239.30T.
Hunt, Hugh S. Hybrid vehicles. 4,405,029, Cl. 180-65.00A.
Huntsinger, James E.: *See*—
Jordan, James L.; Huntsinger, James E.; Steinke, Dale F.; and Williams, David W., 4,405,997, Cl. 366-111.000.
Huszarik, Fred A.: *See*—
Charlebois, Leonard J.; and Huszarik, Fred A., 4,405,083, Cl. 249-97.000.
Hutchinson, Mark E.: *See*—
Moore, Calvin E.; Hutchinson, Mark E.; and Fetterman, David S., 4,405,572, Cl. 423-54.000.
Hyde, James C.: *See*—
Bell, Albert H., III; and Hyde, James C., 4,404,806, Cl. 60-737.000.
Ibrahim, Fayez F.; and Wessel, Terry, to Tyler Refrigeration Corporation. Modular refrigeration assembly having air defrost system. 4,404,816, Cl. 62-282.000.
Ichikawa, Hiroshi: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,405,467, Cl. 252-1.000.
Ichimura, Nobuyoshi: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.
Ichiryu, Ken: *See*—
Nakamura, Ichiro; Takenoshita, Mitsuaki; Ichiryu, Ken; Akasaka, Yoshimichi; and Watanabe, Haruo, 4,404,892, Cl. 91-396.000.
Ide, John D.; Settlemire, David J.; and Novo, Mario C., to Bendix Corporation, The. Selectivity means in amplitude modulated radio receivers. 4,406,019, Cl. 455-245.000.
Idemitsu Kosan Company Limited: *See*—
Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,405,467, Cl. 252-1.000.
Idota, Yoshinori: *See*—
Ohsawa, Katsuyuki; Sugiyama, Katsuhiko; and Idota, Yoshinori, 4,404,859, Cl. 73-861.180.
Igarashi, Mikio: *See*—
Sakano, Takashi; and Igarashi, Mikio, 4,404,763, Cl. 37-250.000.
Iidaka, Toshiharu: *See*—
Koike, Shyouichi; Iidaka, Toshiharu; and Ohyama, Akio, 4,404,866, Cl. 74-546.000.
Ilies, Nicolae, to Cooperativa Agricola de Productie Scornicesti. Process for the obtainment of a biologically active bee-product. 4,405,602, Cl. 424-95.000.
Imamura, Yoshinori: *See*—
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, 4,405,879, Cl. 313-386.000.
Imperial Chemical Industries PLC: *See*—
Barnard, John; and Bloombaum, Barry D., 4,405,551, Cl. 264-245.000.
Punja, Nazim, 4,405,640, Cl. 424-305.000.
Ragg, Pudens L.; Martin, Graham E.; and Smeeton, Roy, 4,405,407, Cl. 162-146.000.
Imperial Metal Industries (Kynoch) Limited: *See*—
Hobbs, John F.; and Sutcliffe, Gordon R., 4,405,392, Cl. 149-109.600.
INA Walzlager Schaeffler KG: *See*—
Oetjen, Jurgen, 4,405,185, Cl. 308-6.00C.
Incorvia, Samuel A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,405,347, Cl. 55-387.000.
Industrie Pirelli S.p.A.: *See*—
Egidi, Paolo; and Franchino, Fulvio, 4,405,555, Cl. 264-315.000.
Ingersoll-Rand Company: *See*—
Larson, John A., 4,405,389, Cl. 148-37.000.
Ingram, Bert M., to Ingram Security Inc. Multiple entry closure for a safe or vault. 4,404,916, Cl. 109-67.000.
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Ingram, Bert M., 4,404,916, Cl. 109-67.000.
Inomata, Akira; Hasegawa, Tsunao; and Ohtake, Yasushi, to Pioneer Electronic Corporation. Magnetic recording and reproducing device. 4,405,953, Cl. 360-65.000.
Inoue, Eiichi: *See*—
Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, 4,405,656, Cl. 427-39.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Otaki, Noriyoshi, 4,405,411, Cl. 204-26.000.
Inoue, Kiyoshi, 4,405,421, Cl. 204-129.200.
Inoue, Kiyoshi; Onoue, Makoto; and Otaki, Noriyoshi, to Inoue-Japax Research Incorporated. Recess electrodepositing method, electrode assembly and apparatus. 4,405,411, Cl. 204-26.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electrochemically grinding a conductive workpiece. 4,405,421, Cl. 204-129.200.
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, to Canon Kabushiki Kaisha. Photographic apparatus. 4,405,227, Cl. 355-27.000.
Inoue, Yoshikazu: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,405,617, Cl. 424-246.000.
Institut Francais Du Petrole: *See*—
Deschamps, Andre; Franckowiak, Sigismond; and Le Page, Jean-Francois, 4,405,442, Cl. 208-107.000.
Institut Problem Litya Akademii Nauk Ukrainskoi SSR: *See*—
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.
Institute Po Mechanika I Biomechanika: *See*—
Georgiev, Vesselin Y.; and Mednikarov, Vladimir S., 4,405,084, Cl. 239-99.000.
Insulating Breaking Clamp, Inc.: *See*—
Shook, David W., 4,405,828, Cl. 174-138.00R.
Intel Corporation: *See*—
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,406,013, Cl. 377-29.000.
Intermatic Incorporated: *See*—
Hatcher, Frank L., 4,404,697, Cl. 4-492.000.
Intermedicat GmbH: *See*—
Voges, Karl-Friedrich; Haacke, Claus; and Heise, Peter, 4,405,163, Cl. 285-305.000.
Intermedics, Inc.: *See*—
Gordon, Pat L.; Calfee, Richard V.; and Miner, Jay, 4,404,972, Cl. 128-419.0PG.
International Business Machines: *See*—
Chow, William W.; Fields, Davis S., Jr.; Hu, Paul Y.; and Lopez, Jorge L., 4,405,961, Cl. 360-129.000.
International Business Machines Corporation: *See*—
Andrade, Thomas L., 4,404,732, Cl. 29-571.000.
Blumentritt, Bruce F.; and Shyan Shen, John C., 4,405,684, Cl. 428-336.000.
Cefarelli, Frank P.; and Evans, Robert T., 4,405,201, Cl. 350-96.210.
Engler, Edward M.; Patel, Vishnubhai V.; and Schumaker, Robert R., 4,405,515, Cl. 260-239.00R.
Flemming, Donald C., 4,405,898, Cl. 328-72.000.
Grobman, Warren D.; Nelson, David A., Jr.; and Warlaumont, John M., 4,405,238, Cl. 356-401.000.
International Cryogenics, Inc.: *See*—
Leonard, Rex D., 4,404,819, Cl. 62-514.00R.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,405,510, Cl. 252-522.00R.
Boden, Richard M.; and Licciardello, Michael, 4,405,646, Cl. 426-3.000.
Boden, Richard M., 4,405,820, Cl. 568-840.000.
International Rectifier Corporation: *See*—
Yang, Ling; Medico, Russell R.; and Baugh, Wesley A., 4,405,595, Cl. 423-600.000.
International Telephone and Telegraph Corporation: *See*—
Turbak, Albin F.; and Hartmann, Peter J., 4,405,549, Cl. 264-188.000.
International Water Saving Systems, Inc.: *See*—
Heinze, Walter O.; Tufts, Wesley M.; and White, Jeffrey F., 4,404,696, Cl. 4-420.000.
Irie, Yoichiro: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, 4,405,226, Cl. 355-14.00D.
Isett, Don D.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,404,919, Cl. 112-121.110.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,404,699, Cl. 8-149.100.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,405,491, Cl. 252-359.00E.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Matsunaga, Mamoru; Usami, Teruo; Okuda, Haruo; and Futamata, Hideo, 4,405,376, Cl. 106-300.000.
Ishii, Kazuo: *See*—
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,405,704, Cl. 430-74.000.

Ishii, Kiyoichi; Fujii, Hideharu; and Kobayashi, Kenji, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Punch through reference diode. 4,405,932, Cl. 357-13.000.

Ishii, Seiji: *See*—
Kuroda, Toshimasa; Ishii, Seiji; and Shibata, Tatsuya, 4,405,686, Cl. 428-374.000.

Ishikawa, Kazutomi, to Mori Machinery Co., Ltd. Tool pot cleaning system for tool magazine. 4,404,728, Cl. 29-568.000.

Ishikawa, Keiichiro: *See*—
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, 4,405,419, Cl. 204-96.000.

Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, to Masayuki Ishikawa. Quinazolinde-dione compounds, process for production thereof and pharmaceutical use thereof. 4,405,623, Cl. 424-251.000.

Ishikawa, Shigeru: *See*—
Mizuno, Megumi; Ishikawa, Shigeru; and Kubo, Eiki, 4,404,877, Cl. 81-57.370.

Ishizaka, Seiichi: *See*—
Mitsuhashi, Yoshinobu; Shimada, Junichi; Sakurai, Kenjiro; and Nakamura, Yukinobu, 4,405,236, Cl. 356-350.000.

Italfarmaco S.p.A.: *See*—
Sportoletti, Giancarlo; and Baglioni, Alessandro, 4,405,643, Cl. 424-311.000.

Italiana Schoum S.p.A.: *See*—
Masi, Paolo; Monopoli, Angela; Saravalle, Adone C.; and Zio, Cesare, 4,405,627, Cl. 424-263.000.

Itoh, Kaoru: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,405,242, Cl. 368-82.000.

Itokawa, Jiro: *See*—
Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.

ITT Industries, Inc.: *See*—
Steffes, Helmut, 4,404,803, Cl. 60-547.100.

Itzel, Hanshelmut, to Celamerck GmbH & Co., KG. Fungicidal compositions. 4,405,605, Cl. 424-173.000.

Iversen, Arthur H. Liquid cooled anode x-ray tubes. 4,405,876, Cl. 313-30.000.

Iwai, Tadashi; Kawahito, Takashi; and Yamada, Tetsuo, to UBE Industries, Ltd. Process for producing silicon nitride powder. 4,405,589, Cl. 423-344.000.

Iwai, Takashi: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.

Iwaki Glass Company Ltd.: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.

Iwaki, Masato: *See*—
Tadokoro, Tomoo; Iwaki, Masato; and Okimoto, Haruo, 4,404,804, Cl. 60-602.000.

Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, to Kabushiki Kaisha Kobe Seiko Sho. Method for correcting measurement errors in tire uniformity inspecting machines. 4,404,848, Cl. 73-146.000.

Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, to Kabushiki Kaisha Kobe Seiko Sho. Method and system for correcting errors of measurement in tire uniformity inspecting machines. 4,404,849, Cl. 73-146.000.

Iwaya, Toshio: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.

Izawa, Fumio, to Tokyo Shibaura Electric Co., Ltd. Endless tape travelling device. 4,405,093, Cl. 242-55.19R.

J. I. Case Company: *See*—
Cochran, Gary L.; Dawson, James E.; and Stromberg, Gary D., 4,405,280, Cl. 414-685.000.
Frisbee, Claude M., 4,405,019, Cl. 172-816.000.
Paulin, Stephen V.; Hillard, Randy H.; and Youngers, Stephen A., 4,404,761, Cl. 37-191.00A.

J. M. Voith GmbH: *See*—
Bahr, Theodor; Heinrich, Hans-Otto; and Thumm, Helmut, 4,405,091, Cl. 241-33.000.

Jablonski, Dane E., to B. F. Goodrich Company, The. Vulcanizable acrylate rubber compositions. 4,405,758, Cl. 525-329.800.

Jacobsen, Stephen C.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,405,305, Cl. 604-49.000.

Jaegle, Bruno, to Siemens Aktiengesellschaft. Electric contact arrangement. 4,405,848, Cl. 200-243.000.

Jagenberg-Werke AG: *See*—
Bensberg, Wolfgang; and Klapp, Hartmut, 4,405,304, Cl. 493-476.000.

Jagtap, Asvinkumar N., to PPG Industries, Inc. Process for halogenation of butadiene polymer in the presence of aluminum-containing material. 4,405,759, Cl. 525-356.000.

Jagur, Joseph, to Yeda Research & Development Co., Ltd. Organometallic polymers, their preparation and compositions containing them. 4,405,771, Cl. 528-266.000.

Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM AB. Method for producing a tubular object of polyethylene terephthalate or similar thermoplastic material from a tubular blank of amorphous material. 4,405,546, Cl. 264-159.000.

James, Robert G., to Armco Inc. Counterbalanced pumps and method of using same. 4,404,863, Cl. 74-89.200.

Jansen, Winfried; and Nolde, Wolfgang, to U.S. Philips Corporation. Receiver for AM stereo signals having a circuit for reducing distortion due to overmodulation. 4,405,835, Cl. 179-1.0GS.

Jansson, Conny; Erlandsson, Lars; and Appelkvist, Rolf, to AB Bahco Verktyg. Wire retainer and diagonal cutting nipper with wire retainer. 4,404,746, Cl. 30-124.000.

Janz, Joachim; and Svejkovsky, Ulrich, to Gebr. Happich GmbH. Fastening device for handles, arms rests etc. on the wall of a vehicle, or the like. 4,404,709, Cl. 16-111.00R.

Jaouen, Adrien: *See*—
Forster, Michel; Jaouen, Adrien; Jorda, Alain; and Rampin, Pierre, 4,405,988, Cl. 364-502.000.

Japan Atomic Energy Research Institute: *See*—
Hosoi, Fumio; Sasaki, Takashi; and Hagiwara, Miyuki, 4,405,426, Cl. 204-159.150.

Japan Marine Science: *See*—
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.

Japan Metal and Chemical Co., Ltd.: *See*—
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, 4,405,419, Cl. 204-96.000.

Jaschek, Juergen; and Krummheuer, Wolf, to Akzona, Incorporated. Resin coated fabric. 4,405,341, Cl. 51-298.000.

Jeffreys, George A.; Tobey, James F., Jr.; and Price, Jean L., to Dudley, Marvin. Process for producing premium quality fish meal from whole fish. 4,405,649, Cl. 426-59.000.

Jenkins, Robert H., Jr.; and Sweeney, William M., to Texaco Inc. Extended aviation jet fuel stabilized with phenoaldehyde amine derivatives. 4,405,338, Cl. 44-78.000.

Jensen, Niels D.; and Johansen, Arne, to Grundfos Pumpenfabrik GmbH. Multi-spindle machine tools. 4,404,729, Cl. 29-568.000.

Jervis B. Webb Company: *See*—
Dehne, Clarence A., 4,405,042, Cl. 198-687.000.

Jessup, James L., to Kendall Company, The. Anesthesia device with selective spray ports. 4,405,308, Cl. 604-200.000.

Jessup, James L., to Kendall Company, The. Anesthesia device. 4,405,322, Cl. 604-232.000.

Jeumont Schneider Corporation: *See*—
Wiart, Albert C., 4,405,888, Cl. 318-803.000.

Jochum, Peter: *See*—
Kindle, Edwin; and Jochum, Peter, 4,405,072, Cl. 227-10.000.

Jodrey, Robert M.; and Pitts, Warren R., to Dennison Manufacturing Company. Bottle turner. 4,405,301, Cl. 432-124.000.

Jodrey, Robert M., to Dennison Manufacturing Company. Article holding turret. 4,405,403, Cl. 156-449.000.

Johannessen, Svein: *See*—
Kolle, Kjell; and Johannessen, Svein, 4,405,855, Cl. 219-501.000.

Johansen, Arne: *See*—
Jensen, Niels D.; and Johansen, Arne, 4,404,729, Cl. 29-568.000.

John, Peter; Artes, Reinhold; Frey, Volker; and Scherer, Matthias, to Wacker-Chemie GmbH. Method for preparing 2-chloroethylsilanes. 4,405,804, Cl. 556-476.000.

Johns, Blair E. Temporary door locking device. 4,405,165, Cl. 292-258.000.

Johnson, Arthur W.; and Braun, Howard R., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Liquid nitrogen level controller. 4,404,809, Cl. 62-49.000.

Johnson, Bertram; and Smith, Arthur R., to Wildt Mellor Bromley Limited. Yarn feeder and changer unit. 4,404,821, Cl. 66-139.000.

Johnson, Irvin D.; Timlin, Gary M.; and Yuill, Robert D., to Marathon Oil Company. Cryogenic storage tank leak detection system. 4,404,843, Cl. 73-49.200.

Johnson, Joseph M.: *See*—
Smith, Joel D.; and Johnson, Joseph M., 4,404,931, Cl. 123-179.00H.

Johnson, Leland: *See*—
Busca, Giovanni; and Johnson, Leland, 4,405,905, Cl. 331-94.100.

Johnson, Michael R., to Pfizer Inc. 9-Hydroxyoctahydrobenzo[c]quinolines analgesic compositions containing them and processes for producing analgesic with them. 4,405,626, Cl. 424-258.000.

Johnson, Robert A.; and Havens, Donald P., to Rockwell International Corporation. Mechanical filter with box-type coupling structure. 4,405,909, Cl. 333-198.000.

Johnston, William S.: *See*—
Bridiguns, Robert J.; and Johnston, William S., 4,404,987, Cl. 137-556.000.

Jones, James S. Gas-liquid mixing metering system. 4,404,984, Cl. 137-88.000.

Jones, Thomas I. Y.: *See*—
Payne, Charles E. G.; Jones, Thomas I. Y.; and Dootson, Peter A., 4,404,797, Cl. 60-39.281.

Jorda, Alain: *See*—
Forster, Michel; Jaouen, Adrien; Jorda, Alain; and Rampin, Pierre, 4,405,988, Cl. 364-502.000.

Jordan, James L.; Huntsinger, James E.; Steinke, Dale F.; and Williams, David W., to F. Korbel and Bros. Apparatus for riddling bottled wines. 4,405,997, Cl. 366-111.000.

Jorgensen, John M.: *See*—
Buurma, Gerald B.; and Jorgensen, John M., 4,405,871, Cl. 307-594.000.

Jorgensen, Karin D.: *See*—
Moody, Alister J.; Thim, Lars; and Jorgensen, Karin D., 4,405,608, Cl. 424-177.000.

Joseph E. Seagram & Sons, Inc.: *See*—
Boucher, Armand R., 4,405,652, Cl. 426-494.000.

Josephson, Edgar F.: *See*—
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,405,168, Cl. 294-103.00R.

Josephson, Martin. Support system for restraining lateral movement of pier-mounted building. 4,404,780, Cl. 52-126.700.

Jost, John W.; Lieffers, William C.; and Whitescarver, Olin D., to Union Oil Company of California. Process for stabilizing silica-rich geothermal brine to prevent silica scaling. 4,405,463, Cl. 210-712.000.

Juaire, Michael P., to Detector Electronics Corp. Radiation detection apparatus having refractive light checking feature. 4,405,234, Cl. 356-239.000.

Julich, Werner; and Muller, Gunter, to Sulzer Brothers Limited. Clutch arrangement for controlling a heddle of a weaving machine. 4,404,993, Cl. 139-66.00R.

Jurek, Leonard B. Servicing steps to be mounted on the bumper of a truck. 4,405,141, Cl. 280-163.000.

Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, to Bayer Aktiengesellschaft. Medicaments for the treatment of disorders of lipometabolism and their use. 4,405,644, Cl. 424-322.000.

Kablitz, Carl: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,405,305, Cl. 604-49.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Koga, Toshiyuki, 4,406,015, Cl. 378-050.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,848, Cl. 73-146.000.
Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,849, Cl. 73-146.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nakamura, Tadao, 4,404,932, Cl. 123-179.00H.

Kabushiki Kaisha Suwa Seikosha: *See*—
Mukaiyama, Fumiaki, 4,405,921, Cl. 340-708.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Ohsawa, Katsuyuki; Sugiyama, Katsuhiko; and Idota, Yoshinori, 4,404,859, Cl. 73-861.180.
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.

Kabushiki Kaisha Yakult Honsha: *See*—
Ozawa, Kazumi; and No, Shinichiro, 4,404,900, Cl. 101-40.000.

Kachemov, Angelo D.: *See*—
Yu, Kin C.; and Kachemov, Angelo D., 4,405,981, Cl. 364-200.000.

Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., Jr., to Hewlett-Packard Company. Liquid crystal disc memory system. 4,405,993, Cl. 365-108.000.

Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, to Sony Corporation. Video signal reproducing apparatus. 4,405,955, Cl. 360-10.300.

Kainzner, Adolf; Gerger, Wolfgang; and Lukas, Walter, to Gmundner Zementwerke Hans Hatschek Aktiengesellschaft. Ceramic fibers and wools and a process for their production. 4,405,723, Cl. 501-36.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Payne, John R., 4,405,433, Cl. 204-225.000.

Kakuta, Atsushi: *See*—
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.

Kalyanasundaram, Kuppuswamy: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Borgarello, Enrico; and Pelizzetti, Ezio, 4,405,424, Cl. 204-157.10R.

Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., to American Hospital Supply Corporation. Method for treatment or prophylaxis of cardiac disorders. 4,405,642, Cl. 424-309.000.

Kamai, Toshimitsu: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,405,955, Cl. 360-10.300.

Kambara, Koji, to Olympus Optical Co., Ltd. Endoscope ocular device. 4,404,964, Cl. 128-4.000.

Kamei, Tsuneaki: *See*—
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Kamhi, Victor M., to American Cyanamid Company. Novel cationic-substituted 9,10-bis-(phenylethynyl)anthracenes. 4,405,513, Cl. 252-700.000.

Kamiya, Shigeru: *See*—
Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, 4,404,798, Cl. 60-296.000.

Kamiya, Yoshiaki: *See*—
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.

Kamperman, David R., to Lancy International, Inc. Automatic revitalization of sulfide processing and treatment solutions. 4,405,462, Cl. 210-709.000.

Kanaly, David B., to Harris Corporation. Low bandwidth closed loop imagery control and communication system for remotely piloted vehicle. 4,405,943, Cl. 358-133.000.

Kanbe, Junichiro: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Ohno, Shigeru, 4,405,702, Cl. 430-60.000.

Kanegae, Tosiyuki: *See*—
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.

Kanmark, Inc.: *See*—
Gibbons, Alfred M., 4,405,110, Cl. 248-221.200.

Kantro, David L.: *See*—
Serafin, Frank G.; Previte, Robert W.; Greening, Nathan R.; Kantro, David L.; and Tang, Fulvio J., 4,405,372, Cl. 106-90.000.

Kanzaki, Koichi; and Taguchi, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor integrated circuit utilizing polycrystalline silicon deposition, oxidation and etching. 4,404,737, Cl. 29-577.00C.

Kanzaki, Koichi: *See*—
Sasaki, Gen; Taguchi, Minoru; Kanzaki, Koichi; and Furukawa, Akihiko, 4,404,738, Cl. 29-577.00C.

Karami, Hamzeh, to Colgate-Palmolive Company. Sanitary napkin assembly. 4,405,310, Cl. 604-383.000.

Karg, John S.: *See*—
Neale, Thomas J.; Alverson, Frederick C.; and Karg, John S., 4,405,561, Cl. 422-145.000.

Kartashevsky, Gennady R.: *See*—
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Tomov, Mikhail B., 4,405,367, Cl. 75-124.000.

Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, to Durkoppwerke GmbH. Buttonhole machine with automatic thread clipping. 4,404,921, Cl. 112-291.000.

Kasuga, Muneo; Nishikawa, Masaji; and Funakubo, Tomoki, to Olympus Optical Company Limited. Electrophotographic apparatus having means for removing undesired charge concentrated on an edge portion of a photosensitive member. 4,405,224, Cl. 355-3.00R.

Kasuya, Hideki: *See*—
Nitta, Tsuneo; and Kasuya, Hideki, 4,405,838, Cl. 179-1.0SD.

Kasuya, Michio: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.

Katagiri, Shigenobu: *See*—
Nishino, Shinichi; Katagiri, Shigenobu; and Kubo, Kazuyuki, 4,405,922, Cl. 340-825.360.

Katano, Seiji; and Atsumi, Masataka, to Dai Nippon Insatsu Kabushiki Kaisha. Process for fabricating gravure printing plate blank. 4,405,709, Cl. 430-307.000.

Kate Models Pty., Limited: *See*—
Pfuhl, Jakob, 4,404,920, Cl. 112-121.150.

Katsuyama Kinzoku Kogyo Kabushiki Kaisha: *See*—
Sugimoto, Mutsumi, 4,404,715, Cl. 24-230.00A.

Kautex Werke Reinold hagen AG: *See*—
Lehnard, Jakob, 4,405,557, Cl. 264-515.000.

Kawada, Toshiya: *See*—
Honda, Harukichi; Kawada, Toshiya; and Tsujitsugu, Yoshiyuki, 4,404,856, Cl. 73-765.000.

Kawaguchi, Toshiyasu: *See*—
Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, 4,405,722, Cl. 501-15.000.

Kawahard, Kuniaki. Boards for sliding on snow. 4,405,139, Cl. 280-12.00H.

Kawahito, Takashi: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Yamada, Tetsuo, 4,405,589, Cl. 423-344.000.

Kawamura, Masaharu: *See*—
Yamamoto, Hiroshi; Uchidoi, Masanori; and Kawamura, Masaharu, 4,405,222, Cl. 354-238.000.

Kawanami, Kohji: *See*—
Nakaya, Keiichi; Kawanami, Kohji; and Hirata, Suekazu, 4,405,592, Cl. 423-421.000.

Kawazoe, Noriyuki: *See*—
Nakata, Tiaki; Kawazoe, Noriyuki; and Takenaka, Toshio, 4,405,750, Cl. 524-717.000.

Kay, David B., to Xerox Corporation. Method of assembling a gradient index lens array having reduction properties. 4,405,207, Cl. 350-320.000.

Kay, Edward L.: *See*—
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,405,532, Cl. 260-816.00R.

Kealey, Kathleen M.: *See*—
Goebel, Franz; and Kealey, Kathleen M., 4,405,694, Cl. 429-101.000.

Kearney & Trecker Corporation: *See*—
Zankl, Frank, 4,404,727, Cl. 29-568.000.

Keim, Karl-Heinz; and Korff, Joachim, to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft. Process for the production of acetaldehyde and ethanol. 4,405,815, Cl. 568-487.000.

Kellner, Gerd: *See*—
Reudelsterz, Helmut; and Kellner, Gerd, 4,404,765, Cl. 42-77.000.

Kelman, Charles D. Intraocular lens. 4,404,694, Cl. 3-13.000.

Kendall Company, The: *See*—
Jessup, James L., 4,405,308, Cl. 604-200.000.
Jessup, James L., 4,405,322, Cl. 604-232.000.

Kermer, Wolf-Dieter: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,405,330, Cl. 8-639.000

Kerr-McGee Nuclear Corporation: *See*—
Baldwin, Roger A.; Stauter, John C.; and Terrell, Donald L., 4,405,464, Cl. 210-717.000.

Kester, Dennis E.: *See*—
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,405,667, Cl. 428-35.000.

Kido, Takayoshi: *See*—
Tamura, Takeo; Hara, Hiroshi; and Kido, Takayoshi, 4,405,887, Cl. 318-443.000.

Kiley, Richard F.; and Larson, Ralph L, Jr., to Thermal Associates, Inc. Method for mounting, electrically isolating and maintaining constant pressure on a semiconductor element. 4,404,739, Cl. 29-588.000.

Kilichowski, Kurt B.: *See*—
Pampalone, Thomas R.; and Kilichowski, Kurt B., 4,405,776, Cl. 528-364.000.

Kim, Gwan, to W. R. Grace & Co. Supported platinum group metal catalysts with controlled metal penetration. 4,405,506, Cl. 252-462.000.

Kim, Snyg N., to Wico Corporation. Trackball device. 4,404,865, Cl. 74-471.0XY.

Kimball, Leonard L. Protective microscope container with remote control mechanism. 4,405,202, Cl. 350-589.000.

Kimberly-Clark Corporation: *See*—
Appel, David W.; and Morman, Michael T., 4,405,297, Cl. 425-72.00S.

Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, to Mita Industrial Company Limited. Developing material supplying control device for electrostatic copying apparatus. 4,405,226, Cl. 355-14.00D.

Kinast, Gunther; Schedel, Michael; and Koebernick, Wolfgang, to Bayer Aktiengesellschaft. Production of N-substituted derivatives of 1-desoxynojirimicin. 4,405,714, Cl. 435-84.000.

Kindle, Edwin; and Jochum, Peter, to Hilti Aktiengesellschaft. Setting device powered by an explosive gas mixture. 4,405,072, Cl. 227-10.000.

King, John O., Jr. Cushioned fastener joint. 4,405,256, Cl. 403-408.000.

King, Steve E.: *See*—
Lange, Ronald E.; and King, Steve E., 4,405,978, Cl. 364-200.000.

King Tool Inc.: *See*—
Emerson, Clarence A., 4,404,749, Cl. 30-164.900.

Kinkelaar, Edmund W.; and Golar, Paul, to Republic Steel Corporation. Tin plating bath composition and process. 4,405,663, Cl. 427-428.000.

Kinoshita, Yuji: *See*—
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.

Kinshofer, Alfred. Clamshell. 4,405,167, Cl. 294-70.000.

Kinson, Philip L., to General Electric Company. Polyphenylene ether resins and compositions heat stabilized with phosphite compounds. 4,405,739, Cl. 524-117.000.

Kinzer, Jay; and Clingman, John W., to Sanilogical Corporation. Clarifier apparatus. 4,405,456, Cl. 210-195.400.

Kinzl, Marwin; and Bergmann, Eduard, to Kostal of America. Electrical circuit for actuation of the relays of a fuel pump. 4,404,939, Cl. 123-333.000.

Kirisawa, Tadashi: *See*—
Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, 4,404,846, Cl. 73-118.000.

Kishimoto, Yoshio: *See*—
Soga, Mamoru; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,405,370, Cl. 106-20.000.

Kiss, Andras: *See*—
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, 4,405,571, Cl. 423-53.000.

Kister, Horst; and Ullrich, Horst, to VDO Adolf Schindling AG. Circuit arrangement for time division multiplex data transmission with a bus system. 4,406,007, Cl. 370-85.000.

Kitamura, Ikuo: *See*—
Atsumi, Shin-Ichi; Sasaki, Masayuki; and Kitamura, Ikuo, 4,405,648, Cl. 426-19.000.

Klapp, Hartmut: *See*—
Bensberg, Wolfgang; and Klapp, Hartmut, 4,405,304, Cl. 493-476.000.

Klasco, Michael A.; and Kornfeld, Irwin H., to Variable Speech Control Company ("VSC"), The. Time compression/expansion with synchronized individual pitch correction of separate components. 4,406,001, Cl. 369-88.000.

Klauke, Erich: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.
Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, 4,405,644, Cl. 424-322.000.

Klein, John F., to Metco Inc. Plasma spray gun with cooling fin nozzle and deionizer. 4,405,853, Cl. 219-121.0PP.

Kleine, William H. Wagon transmission. 4,404,868, Cl. 74-665.0GE.

Kleiner, Fredric: *See*—
Zemelman, Valery B.; and Kleiner, Fredric, 4,404,807, Cl. 62-1.000.

Kleinschmit, Einhard: *See*—
Scheurenbrand, Dieter; and Kleinschmit, Einhard, 4,404,983, Cl. 137-74.000.

Klesper, Hugo: *See*—
Busse, Oswald; and Klesper, Hugo, 4,405,457, Cl. 210-225.000.

Kling, Rudolf; and Scheider, Bernd, to Quick-Rotan Elektromotoren GmbH. Nominal value pick up for drive controls. 4,405,859, Cl. 250-229.000.

Klockner-Humboldt-Deutz AG: *See*—
Guttmann, Friedrich W., 4,405,366, Cl. 75-93.00E.

Klok, Henri. Carpenter's saw guide and square. 4,404,753, Cl. 33-451.000.

Klotz, Marvin R., to Standard Oil Company (Indiana). Crystalline chromosilicate catalytic compositions. 4,405,502, Cl. 252-455.00R.

Klotz, Marvin R., to Standard Oil Company (Indiana). Catalytic compositions. 4,405,504, Cl. 423-458.000.

Klubitschko, Gerd: *See*—
Knabel, Walter; Klubitschko, Gerd; Stempfhuber, Lorenz; and D'Antonio, Nicholas F., 4,405,151, Cl. 280-612.000.

Kluge, Arthur F., to Syntex (U.S.A.) Inc. [1-(1,4-Benzodioxan-2-yl)-4-(4-aminopyrimidin-2-yl]piperazines useful as anti-depressants. 4,405,622, Cl. 424-250.000.

Kluttermann, Jurgen, to Trudtzschler GmbH & Co. KG. Apparatus for withdrawing and gathering a fiber web. 4,404,711, Cl. 19-106.00R.

Knabel, Walter; Klubitschko, Gerd; Stempfhuber, Lorenz; and D'Antonio, Nicholas F., to Marker Patentverwertungsgesellschaft mbH. Locking device for an electronic safety ski binding. 4,405,151, Cl. 280-612.000.

Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process. 4,405,525, Cl. 260-397.100.

Knight, Phyllis. Combination scarf. 4,404,688, Cl. 2-207.000.

Knight, Stanley P., to RCA Corporation. Television signal converting apparatus providing an on-screen tuning display. 4,405,946, Cl. 358-192.100.

Knofel, Hartmut: *See*—
Wegener, Gerhard; Knofel, Hartmut; Ellendt, Gunther; and Petinaux, Marcel, 4,405,527, Cl. 260-453.0PH.

Knopik, Duane L.: *See*—
Hegler, Roy E., 4,404,844, Cl. 73-49.200.

Knopp, Steven D.: *See*—
Elsing, John W.; and Knopp, Steven D., 4,405,136, Cl. 277-12.000.

Kobashi, Kiyoshi: *See*—
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.
Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, 4,404,798, Cl. 60-296.000.

Kobayashi, Haruhiro; Funaki, Hidefumi; and Sakurai, Takehiro, to Anelva Corporation. Sputtering apparatus. 4,405,436, Cl. 204-298.000.

Kobayashi, Hiroo, to Mitsubishi Denki Kabushiki Kaisha. Color cathode ray tube including Nd_2O_3 and Cr_2O_3 in face glass. 4,405,881, Cl. 313-480.000.

Kobayashi, Kenji: *See*—
Ishii, Kiyoichi; Fujii, Hideharu; and Kobayashi, Kenji, 4,405,932, Cl. 357-13.000.

Kobayashi, Shigeru: *See*—
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing aryl- or aralkylbenzene having two benzene rings at least one of which is substituted by at least one 3,3,3-trifluoropropyl group. 4,405,824, Cl. 570-144.000.

Kober, Marvin, to O.K. Machine and Tool Corporation. Printed circuit board holder. 4,405,120, Cl. 269-71.000.

Kobler, Ingo; and Winterholler, Johann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Web threading apparatus for rotary printing machines. 4,404,907, Cl. 101-228.000.

Koch, Annekathrin, Klaus-Michael Koch, executors: *See*—
Koch, Friedrich-Karl, deceased, 4,404,830, Cl. 72-128.000.

Koch, Friedrich-Karl, deceased (by Koch, Annekathrin, Klaus-Michael Koch, executors), to L. Schuler GmbH. Method and apparatus for pressing parts from round stock. 4,404,830, Cl. 72-128.000.

Koch, Paul E.; Bond, Thomas J.; and Adams, Richard C., to Standard Oil Company, The. Method of coextruding diverse materials. 4,405,547, Cl. 264-171.000.

Kodama, Katsuhisa: *See*—
Fujita, Shoichi; Kodama, Katsuhisa; and Yuge, Kiyohiro, 4,405,682, Cl. 428-317.700.

Koebernick, Wolfgang: *See*—
Kinast, Gunther; Schedel, Michael; and Koebernick, Wolfgang, 4,405,714, Cl. 435-84.000.

Koerdt, Reinhold; Schoening, Josef; and Schwiers, Hans-Georg, to Hochtemperatur-Reaktorbau GmbH. Vaulted cover with flange and plurality of pipe fittings. 4,405,055, Cl. 220-215.000.

Koerner, Gotz: *See*—
Nickel, Friedhelm; Koerner, Gotz; Schmidt, Gunter; and Rott, Hans, 4,405,328, Cl. 8-128.00A.

Koga, Toshiyuki, to Kabushiki Kaisha Daini Seikosha. Fluorescent X-ray film thickness gauge. 4,406,015, Cl. 378-050.000.

Kogiso, Takeshi: *See*—
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.

Koguchi, Kenji: *See*—
Omori, Takashi; Koguchi, Kenji; Yamagishi, Masahiko; and Takeuchi, Higehumi, 4,405,951, Cl. 358-256.000.

Kohl, Helmut, to Behringwerke Aktiengesellschaft. Diagnostic agent for the detection of ketone bodies. 4,405,721, Cl. 436-128.000.

Kohno, Tsutomu, to Victor Company of Japan, Limited. Magnetic tape shifting device. 4,405,095, Cl. 242-179.000.

Kohri, Kitijiro, to Olympus Optical Co., Ltd. Endoscope. 4,404,963, Cl. 128-4.000.

Koike, Norio: *See*—
Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, 4,405,935, Cl. 357-31.000.

Koike, Shyouichi; Iidaka, Toshiharu; and Ohyama, Akio, to Nissan Motor Co. Ltd.; and Kokusan Kinzoku Kogyo Kabushiki Kaisha. Regulator handle assembly for the operation of car window glass. 4,404,866, Cl. 74-546.000.

Kojima, Seiji: *See*—
Sugahara, Yujiro, deceased; Usui, Koichi; Ogawa, Masahide; Sato, Teiji; Mizoguchi, Yasuo; and Kojima, Seiji, 4,405,371, Cl. 106-21.000.

Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; and Tsuji, Masakazu, 4,405,488, Cl. 252-299.630.

Kokubu, Yoshinori; Chiba, Jiro; Ichimura, Nobuyoshi; Iwai, Takashi; and Kawaguchi, Toshiyasu, to Asahi Glass Company Ltd.; and Iwaki Glass Company Ltd. Sealing glass compositions. 4,405,722, Cl. 501-15.000.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Koike, Shyouichi; Iidaka, Toshiharu; and Ohyama, Akio, 4,404,866, Cl. 74-546.000.

Kolchinsky, Abel E.; Bouilun, John; and Davis, Wayne, to Miller Fluid Power Corporation. Retaining ring locking device. 4,405,251, Cl. 403-9.000.

Kolkmann, Ingeborg. Makeup eyeglasses with sliding frames. 4,405,213, Cl. 351-59.000.

Kolle, Kjell; and Johannessen, Svein, to FerroFil A/S. Method and apparatus for regulating the temperature of a heating element in a water heater. 4,405,855, Cl. 219-501.000.

Komatsu, Masaaki: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,405,955, Cl. 360-10.300.

Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, to Canon Kabushiki Kaisha. Photoelectric transducing element. 4,405,915, Cl. 338-15.000.

Kompelien, Arlon D., to Honeywell, Inc. Electronic temperature control from a mechanical temperature responsive means. 4,405,080, Cl. 236-78.00D.

Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; Reeder, Kevin J.; and Hontz, Thomas D., to Burlington Industries, Inc. Overbed tray arrangement. 4,404,698, Cl. 5-507.000.

Kondo, Shiro; and Mizuta, Ken, to Alps Electric Co., Ltd. Push-button switch. 4,405,845, Cl. 200-67.0DB.

Konig, Heribert; and Stark, Heinz, to Mannesmann Aktiengesellschaft. Three phase arc melting and reduction furnace. 4,406,008, Cl. 373-102.000.

Koninklijke Textielfabrieken Nijverdal-Ten Cate N.V.: *See*—
Pott, Richard, 4,405,669, Cl. 428-61.000.

Konishi, Motofumi: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.

Konopnicki, Marek J.: *See*—
Eberly, Joseph H.; Drummond, Peter D.; and Konopnicki, Marek J., 4,406,003, Cl. 370-3.000.

Kooijmans, Petrus G.: *See*—
Raudenbusch, Werner T.; Barnhoorn, Adrianus J. M.; Kooijmans, Petrus G.; Sederel, Willem L.; Van Steenis, Adrianus M. C.; and Schets, Theresia F. M., 4,405,662, Cl. 427-386.000.

Kool, Lawrence B.; Nolen, Robert L.; and Solomon, David E. Method of altering the effective bulk density of solid material and the resulting product. 4,405,373, Cl. 106-198.000.

Koomey, Inc.: *See*—
LeMoine, Joseph L., 4,404,989, Cl. 137-596.180.

Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., to Shell Oil Company. Thermosetting resinous binder compositions, their preparation, and use as coating materials. 4,405,763, Cl. 525-438.000.

Kopp, Ernst, to Skischuhfabrik Dynafit Gesellschaft m.b.H. Skiing boot. 4,404,758, Cl. 36-121.000.

Kopp, Klaus F.: *See*—
Helbig, Joachim W.; and Kopp, Klaus F., 4,405,596, Cl. 424-33.000.

Koppers Company, Inc.: *See*—
Dressler, Hans; Lederer, Donald A.; and Noe, James, 4,405,755, Cl. 525-138.000.

Korbanka, Helmut: *See*—
Wiezer, Hartmut; Pfahler, Gerhard; and Korbanka, Helmut, 4,405,735, Cl. 524-95.000.

Korff, Joachim: *See*—
Keim, Karl-Heinz; and Korff, Joachim, 4,405,815, Cl. 568-487.000.

Kornfeld, Irwin H.: *See*—
Klasco, Michael A.; and Kornfeld, Irwin H., 4,406,001, Cl. 369-88.000.

Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, to Hitachi, Ltd. Electronic device and method of fabricating the same. 4,405,242, Cl. 368-82.000.

Koshino, Yutaka; Ajima, Takashi; Ohshima, Jiro; and Abe, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device of mesa type. 4,404,736, Cl. 29-576.00W.

Koskivirta, Veikko; and Haantera, Antti, to Valmet Oy. Method and apparatus for preventing foreign objects from entering into docking basins. 4,405,259, Cl. 405-62.000.

Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Spiro[2H-1,4-benzodioxepin-3(5H)4'-piperidine and -3'pyrrolidine] compounds and their use as antihypertensive agents. 4,405,631, Cl. 424-267.000.

Kosowsky, Lex A., to National Semiconductor Corporation. Plating head. 4,405,432, Cl. 204-206.000.

Kossek, Stanislaw: *See*—
Bacal, Kazimierz; Wierusz, Lech; and Kossek, Stanislaw, 4,404,967, Cl. 128-69.000.

Kostal of America: *See*—
Kinzl, Marwin; and Bergmann, Eduard, 4,404,939, Cl. 123-333.000.

Kovach, Stephen M.; and Cornelius, Edward B., to Ashland Oil, Inc. Homogenization of water and reduced crude for catalytic cracking. 4,405,445, Cl. 208-120.000.

Kovats, Ferenc: *See*—
Angyan, Sandor; Racz, Istvan; Radvanyi, Erzsebet; Kovats, Ferenc; Detre, Tamas; and Sos, Jozsef, 4,405,353, Cl. 11-3.000.

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Kraft, Karl J.: *See*—
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Krallmann, Reinhold: *See*—
Bergmann, Udo; Degen, Helmut; Hansen, Guenter; Krallmann, Reinhold; and Kermer, Wolf-Dieter, 4,405,330, Cl. 8-639.000.

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Bowen, James B.; and Kramer, Charles F., 4,404,995, Cl. 139-92.000.
Root, Stephen J.; and Kramer, Charles F., 4,404,994, Cl. 139-91.000.

Krause, Hans P.: *See*—
Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, 4,405,644, Cl. 424-322.000.

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Hultsch, Gunther; Alstetter, Franz; and Breuer, Uwe, 4,405,454, Cl. 209-279.000.

Krebs, Richard F.; Marek, Patrick J.; and Phillips, Kenneth G., to Nalco Chemical Company. Compositions for on-site mannich polymer process. 4,405,728, Cl. 523-336.000.

Kreis, Gerhard: *See*—
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Kremp, Wilhelm K.: *See*—
Davy, Robert F.; and Kremp, Wilhelm K., 4,405,279, Cl. 414-558.000.

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Krennbauer, Franz, to Voest-Alpine Aktiengesellschaft. Process of producing cement and plant for carrying out the process. 4,405,374, Cl. 106-100.000.

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Schlauer, Johann; Fischer, Herbert; and Kriebel, Manfred, 4,405,593, Cl. 423-574.00R.

Krnjevic, Hrvoje. Drug for curing inflammatory and/or degenerative and/or atrophic mucous-membrane diseases. 4,405,610, Cl. 424-180.000.

Kroh, Adolf: *See*—
Fuchs, Otto; Kroh, Adolf; and Teige, Wolfgang, 4,405,734, Cl. 524-90.000.

Krohn, Hellmut: *See*—
Resch, Reinhard; and Krohn, Hellmut, 4,405,181, Cl. 303-9.000.

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Spratte, Hans-Hermann, 4,405,858, Cl. 250-221.000.

Krone GmbH: *See*—
Muller, Manfred; and Achtnig, Klaus-Peter, 4,405,187, Cl. 339-14.00R.

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Baur, Guenter; Greubel, Waldemar; Krueger, Hans; and Schauer, Alois, 4,405,210, Cl. 350-345.000.

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Jaschek, Juergen; and Krummheuer, Wolf, 4,405,341, Cl. 51-298.000.

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Dixon, David; and Krupicka, William A., 4,404,825, Cl. 70-368.000.

Kruyer, Jan. Preparation of bitumen froths and emulsions for separation. 4,405,446, Cl. 208-188.000.

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Nishino, Shinichi; Katagiri, Shigenobu; and Kubo, Kazuyuki, 4,405,922, Cl. 340-825.360.

Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Nakahara, Yutaka, to Adeka Argus Chemical Co., Ltd. 2,2,6,6-Tetramethyl-4-

piperidyl spiro aliphatic ethers and stabilizers for synthetic polymers. 4,405,736, Cl. 524-102.000.

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Kuchenbecker, Dietrich; and Eckhardt, Erich, to Linde Aktiengesellschaft. Regulating devices for a plurality of pumps driven by a common source. 4,405,287, Cl. 417-216.000.

Kuczenski, Steven R., to Tecumseh Products Company. Self-mounting pneumatic fuel primer. 4,404,933, Cl. 123-187.50R.

Kudo, Mitsuru; and Nakagawa, Isao, to Hitachi, Ltd. Chrominance signal reproducing apparatus. 4,405,937, Cl. 358-40.000.

Kulakov, Gennady I.: *See*—
Shemyakin, Evgeny I.; and Kulakov, Gennady I., 4,405,231, Cl. 356-34.000.

Kulicke and Soffa Industries Inc.: *See*—
Levintov, Chaim; and Shienfeld, Michael, 4,405,074, Cl. 228-41.000.

Kulik, Conrad J.; and Atherton, Linda, to Electric Power Research Institute. Process for coal liquefaction employing a superior coal liquefaction process solvent. 4,405,437, Cl. 208-10.000.

Kull, Leo. Selectable coupling mechanism including article dispensers. 4,405,059, Cl. 221-129.000.

Kulpa, Walter J.; and Paulik, John R., to Pitney Bowes Inc. Paper stacking device. 4,405,125, Cl. 271-195.000.

Kulprathipanja, Santi, to UOP Inc. Extraction of sucrose. 4,405,378, Cl. 127-55.000.

Kumadaki, Itsumaro: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,405,824, Cl. 570-144.000.

Kumpe, Gerhardt: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Wormsbacher, Wilfried, 4,405,603, Cl. 424-101.000.

Kunii, Daizo, to Mittetu Chemical Engineering, Ltd. Process and apparatus for gasifying combustible materials. 4,405,339, Cl. 48-62.00R.

Kuno, Akira: *See*—
Shinoda, Yoshio; and Kuno, Akira, 4,405,924, Cl. 340-825.720.

Kunze, Bernard: *See*—
Hansen, Willi; Kunze, Bernard; and Hermanns, Matthias, 4,405,266, Cl. 408-56.000.

Kupersmit, Julius B. Collapsible tall container. 4,405,077, Cl. 229-41.00R.

Kupfer, Hans; and Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for charging solid fuels into a fixed-bed gasifier. 4,405,340, Cl. 48-86.00R.

Kuraoka, Yasuo; and Hosoda, Norihide, to Hoxan Corporation. Cryogenic impact testing method and machine. 4,405,243, Cl. 374-46.000.

Kurata, Noboru: *See*—
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Sato, Haruhito; Ichikawa, Hiroshi; Hayashi, Hiroshi; and Kurisaki, Konomu, 4,405,467, Cl. 252-1.000.

Kuroda, Toshimasa; Ishii, Seiji; and Shibata, Tatsuya, to Teijin Limited. Crimpable conjugate filamentary yarns having a flattened cross-sectional configuration. 4,405,686, Cl. 428-374.000.

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Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, 4,404,846, Cl. 73-118.000.

Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch Inc. Surgical drainage device with metered air pump. 4,405,309, Cl. 604-317.000.

Kusaka, Yosuke; and Okabe, Nobuo, to Nippon Kogaku K.K. Automatic focusing apparatus for a camera. 4,405,220, Cl. 354-25.000.

Kutzner, Luitpold; and Postenrieder, Erwin, to Kutzner, Luitpold. Furnace with draft-limiter and ventilation. 4,404,956, Cl. 126-293.000.

Kuzel, Maryann; and Leikhim, John W., to Procter & Gamble Company, The. Stable liquid detergents containing aluminosilicate ion exchange material. 4,405,483, Cl. 252-140.000.

Kvalheim, A. M. Self-emptying dump box. 4,405,278, Cl. 414-411.000.

Kwan, Stephen C.: *See*—
Wall, Frederick G.; and Kwan, Stephen C., 4,405,918, Cl. 340-365.00C.

Kwasniewski, Gary K.: *See*—
Nyquist, John D.; Kwasniewski, Gary K.; Thornton, Arthur W.; Vest, Paul E.; and Ducklo, Kenneth E., 4,405,492, Cl. 252-370.000.

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Hunkeler, Walter; and Kyburz, Emilio, 4,405,517, Cl. 260-239.30T.

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Kraft, Edwin H., 4,404,935, Cl. 123-193.00P.

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Abe, Hitoshi, 4,405,268, Cl. 408-182.000.

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Honda, Harukichi; Kawada, Toshiya; and Tsujitsugu, Yoshiyuki, 4,404,856, Cl. 73-765.000.

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Chabrolle, Jacques, 4,405,959, Cl. 360-119.000.

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Koch, Friedrich-Karl, deceased, 4,404,830, Cl. 72-128.000.

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Labib, Mohamed E., to RCA Corporation. Capacitance electronic disc stamper having improved stain resistance and method for the manufacture thereof. 4,405,670, Cl. 428-64.000.

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Ekholm, Pertti, 4,405,206, Cl. 350-318.000.

Laidlaw, Walter, to Claudius Peters, Inc. Aeroslide construction. 4,405,240, Cl. 366-101.000.

Laing, Karsten. Roof skin forming a heat sink. 4,404,960, Cl. 126-432.000.

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Lamberti, Vincent; and Boen, Laurence K., to Lever Brothers Company. Process for producing directly esterified fatty acyl isethionate by a mixed zinc oxide-sulfonic acid catalyst. 4,405,526, Cl. 260-400.000.

Lampe, Alfred: *See*—
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.

Lancaster, Jack; Floyd, John; and Harvey, William. Heart muscle evaluation method and apparatus. 4,404,973, Cl. 128-654.000.

Lancy International, Inc.: *See*—
Kamperman, David R., 4,405,462, Cl. 210-709.000.

Lang, George R.: *See*—
Pritzkow, Dennis H.; Zabel, Jack H.; and Lang, George R., 4,405,863, Cl. 250-385.000.

Lang, Gerard: *See*—
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,405,615, Cl. 424-232.000.

Lange, Ronald E.; and King, Steve E., to Honeywell Information Systems Inc. Microprocesor based computer terminal. 4,405,978, Cl. 364-200.000.

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Hakli, Reijo S., 4,404,917, Cl. 111-3.000.

Lantzsch, Reinhard: *See*—
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.

Lapointe, Denis. Combined denture mold dewaxer and curing basin. 4,405,854, Cl. 219-421.000.

Larkin, Mark E.: *See*—
Gross, James R.; and Larkin, Mark E., 4,405,312, Cl. 604-29.000.

Larson, Dean W.: *See*—
Northe, Melvin M.; and Larson, Dean W., 4,404,712, Cl. 24-129.00R.

Larson, John A., to Ingersoll-Rand Company. Austenitic stainless steel casting alloy for corrosive applications. 4,405,389, Cl. 148-37.000.

Larson, Larry A., to Caterpillar Tractor Co. Fuel supply conditioning and flow measurement circuit. 4,404,847, Cl. 73-119.00A.

Larson, Ralph I., Jr.: *See*—
Kiley, Richard F.; and Larson, Ralph I., Jr., 4,404,739, Cl. 29-588.000.

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Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.

Lawes, Peter: *See*—
Buning, Onno; and Lawes, Peter, 4,404,691, Cl. 3-1.911.

Lawson, John E., to Armco Inc. Subsea template levelling system and method. 4,405,261, Cl. 405-227.000.

Leadlie, Robert J.: *See*—
Fiorentino, Ermenegildo; Wojtowicz, Edward A.; and Leadlie, Robert J., 4,405,972, Cl. 361-417.000.

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Gabriele, Leonard A., 4,405,270, Cl. 409-244.000.
Masser, Lloyd D., 4,405,154, Cl. 280-686.000.

Lebet, Jean-Philippe; Peterle, Leonardo; and Matthe-Doret, Fernand, to Les Fabriques d'Assortiments Reunies. Device for the alignment of a part and a substrate for carrying the part. 4,404,741, Cl. 29-721.000.

LeCarvennec, Francois: *See*—
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,862, Cl. 250-318.000.

Lectrolarm Custom Systems, Inc.: *See*—
Smith, William V., 4,404,923, Cl. 116-214.000.

Lederer, Donald A.: *See*—
Dressler, Hans; Lederer, Donald A.; and Noe, James, 4,405,755, Cl. 525-138.000.

Lee, Cheang K., to Tate & Lyle Public Limited Company. 4'-Halo-substituted sucrose derivatives. 4,405,654, Cl. 426-658.000.

Lee, Chung J., to Plastics Engineering Company. Fast crystallizing polyalkyleneterephthalate resin compositions. 4,405,741, Cl. 524-299.000.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Removal of Mg^{++} and Ca^{++} ions from NaCl brine. 4,405,574, Cl. 423-157.000.

Lee, John M.; and Bauman, William C., to Dow Chemical Company, The. Removal of sulfate ions from brine. 4,405,576, Cl. 423-181.000.

Lee, Kiu H.; and Cieloszyk, Gary S., to Union Carbide Corporation. Catalyst impregnated on fine silica, process for preparing, and use for ethylene polymerization. 4,405,495, Cl. 252-429.00B.

Le Fur, Gerard R.: *See*—
Champseix, Alain A.; and Le Fur, Gerard R., 4,405,789, Cl. 546-176.000.

Legras, Gilbert L.: *See*—
Morane, Bruno P.; and Legras, Gilbert L., 4,404,922, Cl. 116-206.000.

Legros, Jean: *See*—
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,405,800, Cl. 549-419.000.

Lehnard, Jakob, to Kautex Werke Reinold hagen AG. Process for manufacture of hollow bodies from synthetic materials. 4,405,557, Cl. 264-515.000.

Lehureau, Jean-Claude: *See*—
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Cornet, Jean; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,994, Cl. 365-126.000.

Leidenfrost, Wolfgang, to Purdue Research Foundation. High sensitive micromanometer. 4,404,855, Cl. 73-747.000.

Leikhim, John W.: *See*—
Kuzel, Maryann; and Leikhim, John W., 4,405,483, Cl. 252-140.000.

Leitermann, Wulf, to Audi Nsu Union Aktiengesellschaft; and Audi Nsu Union Aktiengesellschaft. Valve controlled stroke piston combustion engine with a cam shaft. 4,404,937, Cl. 123-198.00F.

LeMoine, Joseph L., to Koomey, Inc. Underwater connector for fluid lines. 4,404,989, Cl. 137-596.180.

Lenaghan, Arlene R. Catamenial bandage. 4,405,326, Cl. 604-385.000.

Lender, Adam, to GTE Automatic Electric Incorporated. Method and apparatus for converting binary information into a single-sideband 3-level correlative signal. 4,406,009, Cl. 375-18.000.

Lennon, Thomas C. Interjoist support. 4,405,111, Cl. 248-544.000.

Leonard, Rex D., to International Cryogenics, Inc. Valved cryogenic dewar. 4,404,819, Cl. 62-514.00R.

Leonard, Verna M. Note reading octave isolator. 4,404,886, Cl. 84-471.00R.

Leonard, Willie B. Fluidic repeater. 4,404,897, Cl. 91-506.000.

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Deschamps, Andre; Franckowiak, Sigismond; and Le Page, Jean-Francois, 4,405,442, Cl. 208-107.000.

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Beaussier, Michel; Lesch, Henry; and Evon, Emile, 4,405,665, Cl. 428-17.000.

Leslie, Elmer N.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,404,919, Cl. 112-121.110.

Levardon, Raymond: *See*—
Entremont, Jacques; and Levardon, Raymond, 4,405,651, Cl. 426-241.000.

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LeVeen, Harry H.; LeVeen, Eric G.; and LeVeen, Robert F., 4,404,971, Cl. 128-348.100.

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Lamberti, Vincent; and Boen, Laurence K., 4,405,526, Cl. 260-400.000.

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Spalti, Alfred, 4,405,987, Cl. 364-483.000.

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Lindner, Kurt; and Schutz, Theodor, 4,405,925, Cl. 343-5.0PD.

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Simeth, Claus; Liebert, Oskar; and Theilacker, Klaus, 4,404,905, Cl. 101-183.000.

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Jost, John W.; Lieffers, William C.; and Whitescarver, Olin D., 4,405,463, Cl. 210-712.000.

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Kuchenbecker, Dietrich; and Eckhardt, Erich, 4,405,287, Cl. 417-216.000.

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Sandberg, Glenn A.; and Lindee, Scott A., 4,405,186, Cl. 414-21.000.

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Snyder, Glenn M., 4,404,772, Cl. 51-105.00R.

Livingston, Waylon A. Method and apparatus for ultrasonic testing of tubular goods. 4,404,853, Cl. 73-622.000.

Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., to Polaroid Corporation. Bicyclo nitrogenheterocyclic substituted sulfofluoresceins, fluoresceins and xanthenes. 4,405,788, Cl. 546-165.000.

Lockard, Walter G.: *See*—
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Merrifield, Donald V., 4,405,026, Cl. 180-9.620.

Lockwood, George C., to NCR Corporation. Write/restore/erase signal generator for volatile/non-volatile memory system. 4,405,868, Cl. 307-296.00A.

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Welschof, Hans-Heinrich; and Beier, Rudolf, 4,405,032, Cl. 180-259.000.

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Fisher, E. Eugene; Estes, R. Ray; Lokken, Orrin D.; and Paguette, Elmer G., 4,405,647, Cl. 426-4.000.

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Longbrake, Howard Ray: *See*—
Radish, Madeline L., 4,404,873, Cl. 76-82.000.

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Lopez, Jorge L.: *See*—
Chow, William W.; Fields, Davis S., Jr.; Hu, Paul Y.; and Lopez, Jorge L., 4,405,961, Cl. 360-129.000.

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Morane, Bruno P.; and Legras, Gilbert L., 4,404,922, Cl. 116-206.000.

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LPS Industries, Inc.: *See*—
Schultz, Roland P.; and Schultz, Steven P., 4,405,046, Cl. 206-557.000.

Lubowsky, Jack; and Berger, Ronald, to Tri-Dynamics Dental Co., Inc. Furnace tray with carbon plate. 4,405,300, Cl. 432-2.000.

Lucas Industries Limited: *See*—
Seilly, Alec H., 4,404,943, Cl. 123-458.000.

Lucas Industries plc: *See*—
White, Stephen A., 4,405,968, Cl. 361-195.000.

Lucht, Alfred: *See—*
Baier, Alfred; Lucht, Alfred; Munch, Gerhard; and Pfeuffer, Alfred, 4,405,382, Cl. 148-9.00R.

Ludwig, Gary R.: *See—*
Ball, Douglas C.; Stumpf, William S.; and Ludwig, Gary R., 4,404,776, Cl. 52-29.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Rotter, Gerhard, 4,405,031, Cl. 180-165.000.

Lukas, Walter: *See—*
Kainzner, Adolf; Gerger, Wolfgang; and Lukas, Walter, 4,405,723, Cl. 501-36.000.

Luke, Johannes: *See—*
Bayerle, Armin; Holz, Karl-Heinz; Luke, Johannes; and Riederer, Wolfgang, 4,404,957, Cl. 126-419.000.

Lummus Company, The: *See—*
Bauer, William V., 4,405,362, Cl. 75-24.000.
Simone, Andre A., 4,405,439, Cl. 208-45.000.

Lundstrom, Lennart: *See—*
Hagg, Rune; and Lundstrom, Lennart, 4,404,740, Cl. 29-606.000.

Luscher, Jakob, to Asulab S.A. Low power consumption C-MOS oscillator. 4,405,906, Cl. 331-116.0FE.

Lutz, Michael K.: *See—*
Pritchard, Robert W.; Drozd, Edward J.; and Lutz, Michael K., 4,405,306, Cl. 604-87.000.

Lynch, Conrad L.: *See—*
Tobias, Michael A.; and Lynch, Conrad L., 4,405,764, Cl. 525-443.000.

Lyons, Peter B.: *See—*
Ogle, James W.; and Lyons, Peter B., 4,405,199, Cl. 350-96.190.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Owsianny, Edmund, 4,405,283, Cl. 415-14.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg GmbH: *See—*
Hoffmann, Elmar, 4,405,175, Cl. 296-201.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Fischer, Hermann, 4,404,909, Cl. 101-350.000.
Kobler, Ingo; and Winterholler, Johann, 4,404,907, Cl. 101-228.000.
Simeth, Claus; Liebert, Oskar; and Theilacker, Klaus, 4,404,905, Cl. 101-183.000.

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Simeth, Claus, 4,404,908, Cl. 101-349.000.

Maas, Joachim; Steinberger, Helmut; and Moretto, Hans-Heinrich, to Bayer Aktiengesellschaft. Anti-foam formulation containing an organopolysiloxane. 4,405,490, Cl. 252-358.000.

Macchi, Romualdo. Jack for tensioning cables in prestressed concrete structures. 4,405,114, Cl. 254-29.00A.

Mach, Joe A. Device to position components of shell and tube heat exchanger. 4,405,012, Cl. 165-78.000.

MacMillan Bloedel Limited: *See—*
Dessens, Jan A. H., 4,405,675, Cl. 428-156.000.

Madsen, Nels H.: *See—*
Mclaughlin, Thomas M.; McLeod, William D.; Madsen, Nels H.; and Peyton, Ronald G., 4,405,128, Cl. 272-117.000.

Magna, Henriette: *See—*
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,862, Cl. 250-318.000.
Cornet, Jean; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,994, Cl. 365-126.000.

Magnetic Peripherals Inc.: *See—*
Elsing, John W.; and Knopp, Steven D., 4,405,136, Cl. 277-12.000.

Magnusson, Stig: *See—*
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., 4,406,005, Cl. 370-63.000.

Maignan, Jean: *See—*
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,405,615, Cl. 424-232.000.

Maikuma, Yoshimata: *See—*
Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,848, Cl. 73-146.000.
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Maki, Takao; Masuyama, Tetsuo; and Yokoyama, Toshiharu, to Mitsubishi Chemical Industries Limited. Process for the production of phenols. 4,405,823, Cl. 568-801.000.

Makos, Ronald A.; and Young, James W., to Enterprises International, Inc. Unloading apparatus for log batch former. 4,405,275, Cl. 414-28.000.

Manders, Petrus G. J., to Ruti-Te Strake B.V. Method for inserting and stretching a measured weft yarn length into the weaving shed of a shuttleless weaving machine. 4,404,996, Cl. 139-194.000.

Manev, Veselin: *See—*
Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, 4,405,695, Cl. 429-103.000.

Mangus, James D.; and Cooper, Martin H., to Westinghouse Electric Corp. Nuclear reactor shutdown system. 4,405,558, Cl. 376-233.000.

Mannesmann Aktiengesellschaft: *See—*
Konig, Heribert; and Stark, Heinz, 4,406,008, Cl. 373-102.000.
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.

Mansell, Dennis N., to United Technologies Corporation. Wave front sensing device. 4,405,232, Cl. 356-121.000.

Manson, Mans O.; Sjogreen, Carl-Axel E.; and Bergvall, Goran A., to Perstorp AB. Aqueous metal-working lubricant. 4,405,471, Cl. 252-34.000.

Manuccia, Thomas J.; and Reintjes, John F., to United States of America, Navy. Coherent anti-Stokes Raman device. 4,405,237, Cl. 356-301.000.

Marathon Oil Company: *See—*
Johnson, Irvin D.; Timlin, Gary M.; and Yuill, Robert D., 4,404,843, Cl. 73-49.200.
Werner, Kenneth R.; and Huff, James F., 4,405,036, Cl. 181-110.000.

Marconi Company Limited, The: *See—*
Quilliam, Robert M., 4,405,402, Cl. 156-273.700.

Mardin, Mithat: *See—*
Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, 4,405,644, Cl. 424-322.000.

Marek, Patrick J.: *See—*
Krebs, Richard F.; Marek, Patrick J.; and Phillips, Kenneth G., 4,405,728, Cl. 523-336.000.

Margetts, George; Andrews, Roderic S.; and Legros, Jean, to Sterling Drug Inc. N-Acetyl-para-aminophenyl N'-acetylamino-S-(tetrahydro-2-pyranyl)thioalkanoates. 4,405,800, Cl. 549-419.000.

Marhold, Albrecht: *See—*
Fuchs, Rainer; Klauke, Erich; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; Lantzsch, Reinhard; and Marhold, Albrecht, 4,405,639, Cl. 424-278.000.

Maringer, Robert E.: *See—*
Raman, Ramaswamy V.; and Maringer, Robert E., 4,405,535, Cl. 264-11.000.

Marker-Patentverwertungsgesellschaft mbH.: *See—*
Geisler, Erich, 4,404,839, Cl. 73-1.00B.
Knabel, Walter; Klubitschko, Gerd; Stempfhuber, Lorenz; and D'Antonio, Nicholas F., 4,405,151, Cl. 280-612.000.

Markl, Erich: *See—*
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Krein, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Marko Materials, Inc.: *See—*
Ray, Ranjan; Panchanathan, Viswanathan; and Giessen, Bill C., 4,405,368, Cl. 75-124.000.

Markus Heretische Deuren B.V.: *See—*
Markus, Jan J. G., 4,404,770, Cl. 49-235.000.

Markus, Jan J. G., to Markus Heretische Deuren B.V. Sliding door construction for closing an opening in a wall. 4,404,770, Cl. 49-235.000.

Marmon Group, Inc., The: *See—*
Bione, Angelo A., 4,404,883, Cl. 84-1.030.

Marraud, Alain: *See—*
Genty, Bernard; Marraud, Alain; and Valle, Roger, 4,405,865, Cl. 250-442.100.

Marsh, Frank D.: *See—*
Howard, Edward G., Jr.; and Marsh, Frank D., 4,405,760, Cl. 525-383.000.

Marshall, Sidney W., to Xerox Corporation. Tracking apparatus for read/write head. 4,405,956, Cl. 360-78.000.

Marshek, Kurt M.: *See—*
Burr, Bruce H.; and Marshek, Kurt M., 4,404,840, Cl. 73-7.000.

Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., to Microdynamics, Inc. Control system for providing stitch length control of a sewing machine. 4,404,919, Cl. 112-121.110.

Marten, Gunter: *See—*
Brunnee, Curt; Delgmann, Lothar; and Marten, Gunter, 4,405,860, Cl. 250-288.000.

Martensson, Anders K.: *See—*
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,405,037, Cl. 188-196.00D.

Martin, Graham E.: *See—*
Ragg, Pudens L.; Martin, Graham E.; and Smeeton, Roy, 4,405,407, Cl. 162-146.000.

Martin, John K., III: *See—*
Whitney, Douglas S. G.; and Martin, John K., III, 4,405,318, Cl. 604-155.000.

Martin, John R.: *See—*
Block, Robert S.; and Martin, John R., 4,405,942, Cl. 358-119.000.

Martine, James: *See—*
Rogers, Jack M.; Tokosh, Richard; Porter, Charles; and Martine, James, 4,405,509, Cl. 252-522.00A.

Martinez, Felix J.: *See—*
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Maruyama, Eiichi: *See—*
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, 4,405,879, Cl. 313-386.000.

Marx, Michael K.; and Musante, Louis P. Needlepoint sheet. 4,404,750, Cl. 33-1.00B.

Marx, Richard A.: *See—*
Gorman, Kenneth G.; and Marx, Richard A., 4,404,784, Cl. 52-534.000.

Masaki, Kenji, to Nissan Motor Company Limited. Electronic controlled carburetor. 4,404,941, Cl. 123-339.000.

Masamune, Satoru; and Choy, William, to Massachusetts Institute of Technology. Chiral boron enolate reagents. 4,405,802, Cl. 556-402.000.

Masayuki Ishikawa: *See*—
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.

Masclet, Jean; and Turiot, Andre, to Messier-Hispano-Bugatti. Oleopneumatic suspension with variable throttle orifices, especially for aircraft landing gear. 4,405,119, Cl. 267-64.220.

Masi, Paolo; Monopoli, Angela; Saravalle, Adone C.; and Zio, Cesare, to Italiana Schoum S.p.A. Diphenylpropylamino-pyridine compounds useful as medicines. 4,405,627, Cl. 424-263.000.

Mason, Gorby C.: *See*—
Young, A. Steven; and Mason, Gorby C., 4,405,161, Cl. 285-80.000.

Massachusetts Institute of Technology: *See*—
Masamune, Satoru; and Choy, William, 4,405,802, Cl. 556-402.000.
Rivest, Ronald L.; Shamir, Adi; and Adleman, Leonard M., 4,405,829, Cl. 178-22.100.
Wurtman, Richard J., 4,405,629, Cl. 424-267.000.

Masser, Lloyd D., to Lear Siegler, Inc. Multi-axle equilized suspension system. 4,405,154, Cl. 280-686.000.

Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Analysis element for immunochemical measurement of trace components and method for immunochemical measurement using the same. 4,405,711, Cl. 435-4.000.

Masuda, Tatsuo: *See*—
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,405,027, Cl. 180-56.000.

Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, to Japan Marine Science; Technology Center; and Fuji Electric Company, Ltd. Wave-power generator assembly. 4,405,866, Cl. 290-53.000.

Masumura, Masanori: *See*—
Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, 4,404,934, Cl. 123-190.0BD.

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Maki, Takao; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,405,823, Cl. 568-801.000.

Mata-Garza, Antonio. Fluid mixing technique. 4,405,087, Cl. 239-226.000.

Materias Primas, Monterrey, S.A.: *See*—
Caballero, Alejandro J.; and Holcombe, Ricardo I., 4,405,588, Cl. 423-340.000.

Mathis, Ronald D.; and Reed, Jerry O., to Phillips Petroleum Company. Polymer stabilization. 4,405,745, Cl. 524-429.000.

Matsubara, Hirokazu: *See*—
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, 4,405,879, Cl. 313-386.000.

Matsumoto, Kuniomi: *See*—
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.

Matsumoto, Shinichi: *See*—
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.

Matsunaga, Mamoru; Usami, Teruo; Okuda, Haruo; and Futamata, Hideo, to Ishihara Sangyo Kaisha, Ltd. Titanium dioxide pigment and process for producing same. 4,405,376, Cl. 106-300.000.

Matsuo, Yushin: *See*—
Aihara, Toshiharu; Tahara, Iwao; Matsuo, Yushin; Takahashi, Naoki; Wakabayashi, Takuo, deceased; and Wakabayashi, Shigemasa, executor, 4,405,241, Cl. 368-63.000.

Matsuoka, Hideoki, to Nissan Motor Co., Ltd. Seat belt device for an automotive vehicle. 4,405,155, Cl. 280-802.000.

Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Kogi; and Suzuki, Mitsuo, to Hitachi, Ltd. Garage door control system. 4,405,923, Cl. 340-825.560.

Matsushita Electric Industrial Co., Ltd.: *See*—
Okamoto, Hiroshi, 4,405,885, Cl. 318-254.000.
Soga, Mamoru; Shimotsuma, Wataru; Kisnimoto, Yoshio; and Sekine, Yoichi, 4,405,370, Cl. 106-20.000.

Matsuura, Kiyoshi: *See*—
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, 4,405,419, Cl. 204-96.000.

Matsuura, Mitsuyuki: *See*—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Ukita, Michito; Nakagawa, Hideaki; and Matsuura, Mitsuyuki, 4,405,774, Cl. 526-348.200.

Matth. Hohner AG: *See*—
Zacharias, Ernst, 4,404,884, Cl. 84-258.000.

Matthe-Doret, Fernand: *See*—
Lebet, Jean-Philippe; Peterle, Leonardo; and Matthe-Doret, Fernand, 4,404,741, Cl. 29-721.000.

Matthies, Dennis L.: *See*—
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Mauro, Gene A.: *See*—
Payne, Arnold F.; Mauro, Gene A.; Cumpton, Wayne L.; and Orr, George J., 4,405,171, Cl. 296-19.000.

Mauser-Werke Oberndorf GmbH: *See*—
Reudelsterz, Helmut; and Kellner, Gerd, 4,404,765, Cl. 42-77.000.

May, George A. Optical parametrons. 4,405,869, Cl. 307-405.000.

Mayer, Bruno F. P., to Discovision Associates. Hot sprue valve assembly for an injection molding machine. 4,405,540, Cl. 264-106.000.

Mayer, Herbert E., to Censor Patent- und Versuchs-Anstalt. Method of projecting printing on semiconductor substrate and workpiece including such substrate. 4,405,229, Cl. 355-77.000.

McAlpine, Frederick W., to Barr & Stroud Limited. Fire control system. 4,404,890, Cl. 89-41.00E.

MCC Corporation: *See*—
Ohyama, Taketomo, 4,404,721, Cl. 29-33.00T.

McCabe, Francis J., to Prefco Products, Inc. Economy, angle-blade damper kit. 4,404,990, Cl. 137-601.000.

McClements, William L.: *See*—
Vande Woude, George F.; McClements, William L.; Oskarsson, Marianne K.; and Blair, Donald G., 4,405,712, Cl. 435-5.000.

McCormick-Goodhart, Mark H.; Cannella, Vincent D.; and Minko, Robert, to Energy Conversion Devices, Inc. Apparatus for recording surface topology. 4,404,926, Cl. 118-641.000.

McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., to Texaco Inc. Demulsification of bitumen emulsions. 4,405,015, Cl. 166-267.000.

McCracken, Richard W.; Textoris, Melvin A.; and Williams, Philip J., to GF Business Equipment, Inc. Post cover plate. 4,404,785, Cl. 52-290.000.

McDaniel, Max P., to Phillips Petroleum Company. Polymerization process using chromium on a support treated with titanium polymer. 4,405,768, Cl. 526-96.000.

McDermott, Lewis J., III: *See*—
Wald, William, 4,405,668, Cl. 428-40.000.

McDonnell Douglas Corporation: *See*—
Byrd, Norman R., 4,405,427, Cl. 204-181.00R.

McEntire, Edward E.: *See*—
McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., 4,405,015, Cl. 166-267.000.

McEntire, John E.; and Papermaster, Ben W., to Cancer Research Center. Extraction and purification of biologically active lymphokines. 4,405,601, Cl. 424-95.000.

McEvoy, James T., to Milsco Manufacturing Company. Foam article and method of preparation. 4,405,681, Cl. 428-309.900.

McGill, Charles K.; and Bailey, Thomas D., to Reilly Tar & Chemical Corp. Process for preparing 2-alkylamino- and 2-amino-5-alkylpyridines. 4,405,790, Cl. 546-304.000.

McGill, Eugene C.; and Bell, Ronald D., to McGill Incorporated. Process for reduction of oxides of nitrogen. 4,405,587, Cl. 423-235.000.

McGill Incorporated: *See*—
McGill, Eugene C.; and Bell, Ronald D., 4,405,587, Cl. 423-235.000.

McGinniss, Vincent D.: *See*—
Rodgers, Stephen D.; Dick, Richard J.; and McGinniss, Vincent D., 4,405,761, Cl. 525-404.000.

McHugh, Leo A., Jr. Continuous flow, variable capacity self-compensating floating weir. 4,405,458, Cl. 210-242.300.

McKnight, James B., to Fulghum Industries, Inc. Take up system for long lengths of high pressure hose. 4,404,986, Cl. 137-355.170.

McLaughlin, Donald W.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., 4,406,005, Cl. 370-63.000.

Mclaughlin, Thomas M.; McLeod, William D.; Madsen, Nels H.; and Peyton, Ronald G., to Totem, Inc. Muscular exercise apparatus and method. 4,405,128, Cl. 272-117.000.

McLeod, William D.: *See*—
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McNeely, Gerald W., to Akzona Incorporated. Flame retardant additives and flame retardant polyester compositions. 4,405,738, Cl. 524-116.000.

Mead, Keith E.: *See*—
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Mecklenborg, Richard A., to Singer Company, The. Optical probe. 4,405,941, Cl. 358-104.000.

Medico, Russell R.: *See*—
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Mednikarov, Vladimir S.: *See*—
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Meiji Seika Kaisha Ltd.: *See*—
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.

Meltsner, Bernard R.: *See*—
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Melzer, Gerhard: *See*—
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Meredith, Gerald R.: *See*—
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Merk, Wolfgang: *See*—
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Merrell Dow Pharmaceuticals Inc.: *See*—
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Schnettler, Richard A.; Dage, Richard C.; and Grisar, Johann M., 4,405,635, Cl. 424-273.00R.

Merrell Toraude et Compagnie: *See*—
Gerhart, Fritz E., 4,405,530, Cl. 260-465.50R.
Merrifield, Donald V., to Lockheed Missiles & Space Company, Inc. Mounting mechanism for endless traction band system. 4,405,026, Cl. 180-9.620.
Merril, Carl R., to United States of America, Health and Human Services. Silver stains for protein in gels. 4,405,720, Cl. 436-86.000.
Messer Griesheim GmbH: *See*—
Baier, Alfred; Lucht, Alfred; Munch, Gerhard; and Pfeuffer, Alfred, 4,405,382, Cl. 148-9.00R.
Messier-Hispano-Bugatti: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
Kupfer, Hans; and Rudolph, Paul, 4,405,340, Cl. 48-86.00R.
Schlauer, Johann; Fischer, Herbert; and Kriebel, Manfred, 4,405,593, Cl. 423-574.00R.
Metco Inc.: *See*—
Klein, John F., 4,405,853, Cl. 219-121.0PP.
Meyer, Larry P., to Nelson Irrigation Corporation. Water distributing assembly. 4,405,085, Cl. 239-178.000.
Meyerhoff, Jerome D., to Motorola, Inc. Signal equalization selector. 4,405,836, Cl. 179-1.00D.
Michelson, Robin P., to University of California, The Regents of The. Apparatus for selective noise suppression for hearing aids. 4,405,831, Cl. 179-1.00P.
Microdynamics, Inc.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,404,919, Cl. 112-121.110.
Mid-West Transformer Company: *See*—
Finkbeiner, Ernest, 4,405,913, Cl. 336-98.000.
Miesch, Johann: *See*—
Christ, Alfred; and Miesch, Johann, 4,404,724, Cl. 29-116.0AD.
Miesel, John L., to Eli Lilly and Company. 1-Benzoyl-3-(arylphyridyl-)urea compounds. 4,405,552, Cl. 424-263.000.
Miguel, Anthony S., to United States of America, Army. Composite floor armor for military tanks and the like. 4,404,889, Cl. 89-36.00A.
Mihara, Yuji: *See*—
Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, 4,405,711, Cl. 435-4.000.
Mikhail, Ezzat A., to Minnesota Mining and Manufacturing Company. Acyclicacylaminoperfluoroalkanesulfonanilides and derivatives thereof. 4,405,359, Cl. 71-103.000.
Miki, Yukio: *See*—
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,405,221, Cl. 354-173.000.
Miles Laboratories, Inc.: *See*—
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Miller, Anthony J.: *See*—
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,405,984, Cl. 364-410.000.
Miller, David: *See*—
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Miller Fluid Power Corporation: *See*—
Kolchinsky, Abel E.; Bouilun, John; and Davis, Wayne, 4,405,251, Cl. 403-9.000.
Miller, Harry C.; and Evans, Walter R., to Sargent & Greenleaf, Inc. View limiting dial and ring structure for combination locks and the like. 4,404,823, Cl. 70-333.00A.
Miller, Jack V., to Gravity Guidance, Inc. Doorway mounted horizontal bar. 4,405,127, Cl. 272-62.000.
Miller, Jesse D., Jr.; and Petzold, James R., to Armstrong World Industries, Inc. Non-skid plastic flooring product and method of manufacture. 4,405,657, Cl. 427-54.100.
Millner, Tivadar: *See*—
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, 4,405,571, Cl. 423-53.000.
Milsco Manufacturing Company: *See*—
McEvoy, James T., 4,405,681, Cl. 428-309.900.
Mimata, Tsutomu: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,405,242, Cl. 368-82.000.
Minami, Katsuji: *See*—
Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.
Miner, Jay: *See*—
Gordon, Pat L.; Calfee, Richard V.; and Miner, Jay, 4,404,972, Cl. 128-419.0PG.
Minko, Robert: *See*—
McCormick-Goodhart, Mark H.; Cannella, Vincent D.; and Minko, Robert, 4,404,926, Cl. 118-641.000.
Minnesota Mining and Manufacturing Company: *See*—
Downing, Edward J.; and Fisch, Richard S., 4,405,678, Cl. 428-215.000.
Gebeke, Charles D., 4,405,097, Cl. 242-199.000.
Mikhail, Ezzat A., 4,405,359, Cl. 71-103.000.
Patterson, Richard A., 4,405,056, Cl. 220-271.000.
Pohl, Daniel P., 4,405,676, Cl. 428-164.000.
Young, Chung I.; and Barber, Loren L., Jr., 4,405,497, Cl. 252-431.00R.
Minolta Camera Kabushiki Kaisha: *See*—
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,405,221, Cl. 354-173.000.
Minowa, Junichiro: *See*—
Fujii, Yohji; and Minowa, Junichiro, 4,405,405, Cl. 156-633.000.
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, to Japan Metal and Chemical Co., Ltd. Method for producing electrolytic manganese dioxide. 4,405,419, Cl. 204-96.000.
Mita Industrial Company Limited: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, 4,405,226, Cl. 355-14.00D.
Mitchell, Daniel M.; and Durspek, William J., to Rockwell International Corporation. Audio tracking pulse-width modulated power supply. 4,405,976, Cl. 363-72.000.
Mitchell, David C. Coupling for an articulated vehicle or the like. 4,405,146, Cl. 280-432.000.
Mitscher, Lester A., to Adria Laboratories Inc. Anthracycline synthesis. 4,405,522, Cl. 260-365.000.
Mitsubishi Chemical Industries Limited: *See*—
Ando, Masao; Hirota, Tetsuya; and Shioda, Katashi, 4,405,455, Cl. 210-191.000.
Maki, Takao; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,405,823, Cl. 568-801.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujimoto, Takanori; and Tada, Yasuo, 4,404,952, Cl. 123-602.000.
Kobayashi, Hiroo, 4,405,881, Cl. 313-480.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Tatebe, Yoshikazu; Egami, Masafumi; and Miyawaki, Toshimitsu, 4,404,936, Cl. 123-196.00R.
Mitsubishi Petrochemical Company Limited: *See*—
Hashimoto, Fukashi, 4,405,775, Cl. 526-351.000.
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Ukita, Michito; Nakagawa, Hideaki; and Matsuura, Mitsuyuki, 4,405,774, Cl. 526-348.200.
Mitsuhashi, Yoshinobu; Shimada, Junichi; Sakurai, Kenjiro; and Nakamura, Yukinobu; to Ishizaka, Seiichi; and Honda Giken Kogyo Kabushiki Kaisha. Semiconductor ring laser apparatus. 4,405,236, Cl. 356-350.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Hasui, Hiroshi; Furihata, Toshikazu; Takanashi, Kazuko; and Ohmori, Masahiko, 4,405,807, Cl. 560-75.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.
Mitsuzawa, Hideaki: *See*—
Murase, Yasushi; Kanegae, Toiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.
Mittetu Chemical Engineering, Ltd.: *See*—
Kunii, Daizo, 4,405,339, Cl. 48-62.00R.
Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Injection site with check valve inlet. 4,405,316, Cl. 604-86.000.
Miura, Yosinari: *See*—
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Ukita, Michito; Nakagawa, Hideaki; and Matsuura, Mitsuyuki, to Mitsubishi Petrochemical Company Limited. Ethylene copolymer. 4,405,774, Cl. 526-348.200.
Mixon, James L., Jr., to AMP Incorporated. Electrical connector. 4,405,827, Cl. 174-94.00R.
Miyamoto, Yoshiko: *See*—
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.
Miyane, Masashi: *See*—
Yanagita, Shuichi; Miyoshi, Tsutomu; and Miyane, Masashi, 4,405,025, Cl. 177-210.0FP.
Miyashita, Masahiko: *See*—
Nakajima, Kazuhisa; Miyashita, Masahiko; Hakozaki, Susumu; and Chosakon, Yoshinori, 4,405,808, Cl. 560-247.000.
Miyawaki, Toshimitsu: *See*—
Tatebe, Yoshikazu; Egami, Masafumi; and Miyawaki, Toshimitsu, 4,404,936, Cl. 123-196.00R.
Miyazaki, Hiroshi; and Arika, Junji, to Toyo Soda Manufacturing Co., Ltd. Zeolite powder having high flowability, process for preparing same and detergent composition containing same. 4,405,484, Cl. 252-174.250.
Miyazaki, Takeaki: *See*—
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.
Miyoshi, Tsutomu: *See*—
Yanagita, Shuichi; Miyoshi, Tsutomu; and Miyane, Masashi, 4,405,025, Cl. 177-210.0FP.
Mizoguchi, Yasuo: *See*—
Sugahara, Yujiro, deceased; Usui, Koichi; Ogawa, Masahide; Sato, Teiji; Mizoguchi, Yasuo; and Kojima, Seiji, 4,405,371, Cl. 106-21.000.
Mizuno, Megumi; Ishikawa, Shigeru; and Kubo, Eiki, to Sanyo Industries, Ltd.; and Muro Kinzoku Kogyo Co., Ltd. Power-driven screwdriver. 4,404,877, Cl. 81-57.370.
Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugahara, Yujiro, deceased; Usui, Koichi; Ogawa, Masahide; Sato, Teiji; Mizoguchi, Yasuo; and Kojima, Seiji, 4,405,371, Cl. 106-21.000.

Mizuta, Ken: *See—*
Kondo, Shiro; and Mizuta, Ken, 4,405,845, Cl. 200-67.0DB.

MM Systems Corporation: *See—*
Lolley, Ted E.; and Driggers, Randolph W., 4,404,777, Cl. 52-60.000.

Moakler, William A.; and Ringstad, Ralph H., to Automatic Switch Company. System for transferring a load between two power sources without interruption of power to the load. 4,405,867, Cl. 307-64.000.

Mobay Chemical Corporation: *See—*
Bernard, David L.; Backus, John K.; and Doheny, Anthony J., Jr., 4,405,725, Cl. 521-112.000.
Carter, Russell P., Jr., 4,405,731, Cl. 524-47.000.

Mobil Oil Corporation: *See—*
Hungerford, Gordon P., 4,405,550, Cl. 264-216.000.
Okorodudu, Abraham O. M., 4,405,470, Cl. 252-32.70E.
Squier, Joann H., 4,405,666, Cl. 428-35.000.
Stead, George E.; and Young, Lewis B., 4,405,818, Cl. 568-781.000.
Tobias, Michael A.; and Lynch, Conrad L., 4,405,764, Cl. 525-443.000.
Zachariadis, Robert G., 4,405,999, Cl. 367-23.000.

Mock, George E., to Western Electric Company, Inc. Method and apparatus for trimming elongated articles. 4,404,882, Cl. 83-869.000.

Moczygemba, George A.; and Udipi, Kishore, to Phillips Petroleum Company. Haze-free, clear, impact-resistant resinous polymers. 4,405,754, Cl. 525-102.000.

Modern Inventions (Proprietary) Limited: *See—*
Winter, Albert J., 4,404,708, Cl. 16-110.00R.

Modica, Frank S.: *See—*
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,405,443, Cl. 208-113.000.

Moirez, Jacques: *See—*
Saint-Sevin, Michel; Blot, Michel; and Moirez, Jacques, 4,405,204, Cl. 350-174.000.

Mommer, Richard P.: *See—*
Thomas, Johnny M., II; and Mommer, Richard P., 4,405,354, Cl. 71-21.000.

Mondragon, Ralph. Solar heating system. 4,404,959, Cl. 126-429.000.

Moninski, Joseph P., Jr.: *See—*
Dizon, Edmund S.; and Moninski, Joseph P., Jr., 4,405,844, Cl. 200-50.00A.

Monopoli, Angela: *See—*
Masi, Paolo; Monopoli, Angela; Saravalle, Adone C.; and Zio, Cesare, 4,405,627, Cl. 424-263.000.

Monsan, Pierre, to Beghin-Say, S.A. Enzymes immobilized on a solid support containing cellulose and lignin. 4,405,715, Cl. 435-105.000.

Monsanto Company: *See—*
Carroll, W. Eamon; and Chan, Albert S., 4,405,814, Cl. 568-462.000.
Deets, Gary L.; and Trementozzi, Quiriano A., 4,405,753, Cl. 525-68.000.
Ebner, Jerry R., 4,405,498, Cl. 252-432.000.
Franz, John E., 4,405,531, Cl. 260-501.120.
Sikorski, James A.; and Hoobler, Mary A., 4,405,356, Cl. 71-87.000.
Woodcock, Maurice L., 4,405,536, Cl. 264-25.000.

Montgomery, Mark S.: *See—*
Stech, Eric N.; Montgomery, Mark S.; and Bates, J. Frederick, 4,405,809, Cl. 562-487.000.

Monvoisin, Jacques, to Societe Tecal. Automatic silk-screen printing machine including an electromagnet device for moving the doctor blade downwards. 4,404,904, Cl. 101-126.000.

Moody, Alister J.; Thim, Lars; and Jorgensen, Karin D., to Novo Industri A/S. Novel peptide. 4,405,608, Cl. 424-177.000.

Mooney, Joseph R. Leak detector for intermittent pressure pipe lines. 4,404,842, Cl. 73-40.50R.

Moore, Calvin E.; Hutchinson, Mark E.; and Fetterman, David S., to MorChem Products, Inc. Recovery of molybdenum. 4,405,572, Cl. 423-54.000.

Moore, Sanders H.; and Dotson, Ronald L., to Olin Corporation. Process for the removal of chlorate and hypochlorite from spent alkali metal chloride brines. 4,405,465, Cl. 210-757.000.

Morane, Bruno P.; and Legras, Gilbert L., to L'Oreal. Ageing indicator. 4,404,922, Cl. 116-206.000.

Morca, Inc.: *See—*
Cruz, Mamerto M., Jr., 4,405,324, Cl. 604-376.000.

MorChem Products, Inc.: *See—*
Moore, Calvin E.; Hutchinson, Mark E.; and Fetterman, David S., 4,405,572, Cl. 423-54.000.

Moretto, Hans-Heinrich: *See—*
Maas, Joachim; Steinberger, Helmut; and Moretto, Hans-Heinrich, 4,405,490, Cl. 252-358.000.

Mori Machinery Co., Ltd.: *See—*
Ishikawa, Kazutomi, 4,404,728, Cl. 29-568.000.

Mori, Mitsuyoshi, to Yanmar Diesel Engine Co., Ltd. Fuel for diesel engine. 4,405,337, Cl. 44-56.000.

Mori, Yasuki: *See—*
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.

Moriguchi, Soyao: *See—*
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.

Morimoto, Kiyoshi: *See—*
Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, 4,405,226, Cl. 355-14.00D.

Morishita, Hirosada: *See—*
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.

Morita, Ken: *See—*
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kunioni; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.

Morita, Minoru; Hosokawa, Etsuo; and Arahara, Kohzoh, to Showa Electric Wire & Cable Co., Ltd. Polyborosiloxane composition for production of electrically insulating layer and insulated electric wire using the composition. 4,405,687, Cl. 428-383.000.

Morman, Michael T.: *See—*
Appel, David W.; and Morman, Michael T., 4,405,297, Cl. 425-72.00S.

Morton, John S., to Whipp & Bourme (1975) Limited. Arc chutes. 4,405,847, Cl. 200-144.00R.

Moscarillo, Thomas L. Emergency light sources. 4,405,973, Cl. 362-34.000.

Mosebach Electric & Supply Company: *See—*
Nadler, M. Princeton; and Miller, David, 4,405,216, Cl. 351-237.000.

Moser, Winfried: *See—*
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,404,841, Cl. 73-35.000.

Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, to Consiglio Nazional delle Ricerche; and Accademia Bulgara delle Scienze. Cells having cathodes derived from alkali salts of chromium dichalcogenides. 4,405,695, Cl. 429-103.000.

Motohashi, Minoru, to Pioneer Electronic Corporation. Automatic FM tuner. 4,406,018, Cl. 455-164.000.

Motorola, Inc.: *See—*
Ecklund, Lawrence M., 4,405,837, Cl. 179-1.0GS.
Meyerhoff, Jerome D., 4,405,836, Cl. 179-1.00D.
Weiss, David L.; Ziolko, Eric F.; and Williams, Tim A., 4,406,010, Cl. 375-32.000.
Wurzburg, Henry, 4,405,899, Cl. 330-107.000.

Moulinex, Societe Anonyme: *See—*
Brison, Marc P., 4,405,998, Cl. 366-264.000.

Mount, Gordon L.; and Hesler, Benjamin F., to Carrier Corporation. Method of preventing refrigeration compressor lubrication pump cavitation. 4,404,811, Cl. 62-84.000.

Mravic, Brian; and Shapiro, Eugene, to Olin Corporation. Process and apparatus for improving cold rollability and/or strip annealability of metals and metal alloys. 4,405,386, Cl. 148-11.50A.

MTA Muszaki Fizikai Kutato Intezete: *See—*
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, 4,405,571, Cl. 423-53.000.

MTD Products Inc.: *See—*
Parikh, Bhupendra A., 4,404,864, Cl. 74-197.000.

MTU Motoren-Und-Turbinen-Union Munchen GmbH: *See—*
Albrecht, Gunter; Sickinger, Albert; and Schmuhl, Hans-Jurgen, 4,405,284, Cl. 415-174.000.

Mueller, Arthur L.: *See—*
Cherry, Hitesh; Mueller, Arthur L.; and Werner, Walter M., 4,405,195, Cl. 339-252.00R.

Mueller, Gerhard; and Puritscher, Ernst, to Siemens Aktiengesellschaft. Gear unit. 4,404,867, Cl. 74-665.0GA.

Muirhead, Walter B. Magnetic tool retaining device. 4,405,108, Cl. 248-206.00A.

Mukaiyama, Fumiaki, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device. 4,405,921, Cl. 340-708.000.

Mukherjee, Shib P., to Chicago Bridge & Iron Company. Indirect-direct freeze exchange concentrator and method. 4,405,349, Cl. 62-532.000.

Mukunoki, Yasuo: *See—*
Yamada, Yasuyuki; Tsuji, Nobuo; Okita, Tsutomu; and Mukunoki, Yasuo, 4,405,481, Cl. 252-62.540.

Mullany, David A. Location indicator for use in baseball and similar games. 4,405,130, Cl. 273-25.000.

Muller, Gunter: *See—*
Julich, Werner; and Muller, Gunter, 4,404,993, Cl. 139-66.00R.

Muller, Hanns P.; Wagner, Kuno; Mummenhoff, Peter; Wallpott, Gottfried; and Scheuss, Karlheinz, to Bayer Aktiengesellschaft. Aqueous aminoplastic resin dispersions. 4,405,751, Cl. 524-720.000.

Muller, Hans J.; Honig, Helmar; and Horlitz, Werner, to EC Erdolchemie GmbH. Halogen compound promoted Al_2O_3 and/or SiO_2 for the preparation of isoalkenes. 4,405,500, Cl. 252-433.000.

Muller, Klaus: *See—*
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,404,841, Cl. 73-35.000.

Muller, Manfred; and Achtnig, Klaus-Peter, to Krone GmbH. Connector assembly for PCM cables. 4,405,187, Cl. 339-14.00R.

Muller, Robert D.: *See—*
Walter, Richard P.; and Muller, Robert D., 4,405,082, Cl. 239-91.000.

Muller, Werner H.: *See—*
Berthold, Rudiger; and Muller, Werner H., 4,405,813, Cl. 564-415.000.

Multiform Desiccants, Inc.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,405,347, Cl. 55-387.000.

Mumby, Edward S., to Exploration Logging, Inc. Apparatus for well logging while drilling. 4,405,021, Cl. 175-48.000.

Mummenhoff, Peter: *See*—
Muller, Hanns P.; Wagner, Kuno; Mummenhoff, Peter; Wallpott, Gottfried; and Scheuss, Karlheinz, 4,405,751, Cl. 524-720.000.
Munch, Gerhard: *See*—
Baier, Alfred; Lucht, Alfred; Munch, Gerhard; and Pfeuffer, Alfred, 4,405,382, Cl. 148-9.00R.
Mungin, Halbert: *See*—
Brooker, Lenon G.; and Mungin, Halbert, 4,405,690, Cl. 428-503.000.
Munker, Max: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,404,831, Cl. 72-148.000.
Munsterer, Gerald A. Ski trail resurfacing apparatus. 4,404,762, Cl. 37-219.000.
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, to Sterling Drug Inc. 2,6-Dialkoxy-3-(α-alkoxybenzyl)tetrahydropyrans used as intermediates to make 2-benzylideneglutaraldehydes. 4,405,795, Cl. 549-417.000.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,472, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,473, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,474, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,475, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,476, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,477, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,478, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,479, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, to Taiyo Yuden Co., Ltd. Dielectric ceramic materials with insulated boundaries between crystal grains, and process for preparation. 4,405,480, Cl. 252-62.3BT.
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, to Nippon Aluminum Mfg. Co., Ltd., The; Nippon Alumi Jutaku-Kenzai Kogyo Co., Ltd.; Nippon Aluminum Mfg. Co., Ltd., The; and Nippon Alumi Jutaku-Kenzai Kogyo Co., Ltd. Roller assembly for sliding closures. 4,404,771, Cl. 49-425.000.
Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro, 4,405,560, Cl. 422-102.000.
Murata, Masayoshi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,405,617, Cl. 424-246.000.
Murata, Michihiro, to Murata Manufacturing Co., Ltd. Carrier for holding analytical samples. 4,405,560, Cl. 422-102.000.
Murdoch, Merle A. Portable bathroom hangers for hygienic irrigation equipment. 4,405,109, Cl. 248-215.000.
Muro Kinzoku Kogyo Co., Ltd.: *See*—
Mizuno, Megumi; Ishikawa, Shigeru; and Kubo, Eiki, 4,404,877, Cl. 81-57.370.
Murphy, Brian J. M.: *See*—
Hartshorn, Frank; Murphy, Brian J. M.; and Storer, Richard E., 4,404,701, Cl. 12-127.000.
Murphy, David J.; and Phillips, Leslie N., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Materials suitable for thermosetting. 4,405,543, Cl. 264-123.000.
Murphy, Walter T.; and Guiley, Clifford D., Jr., to B. F. Goodrich Company, The. Stabilized hydroxyl terminated reactive liquid polymers. 4,405,817, Cl. 568-701.000.
Murray, Michael A.: *See*—
Calhoun, L. Owen; and Murray, Michael A., 4,404,779, Cl. 52-126.200.
Musante, Louis P.: *See*—
Marx, Michael K.; and Musante, Louis P., 4,404,750, Cl. 33-1.00B.
Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Process for the production of high molecular weight polychloroprene and its use as a starting material for adhesives. 4,405,742, Cl. 524-315.000.
Muscoplat, Richard D. Card negative holder and method of manufacture. 4,405,228, Cl. 355-75.000.
N G K Spark Plug Co., Ltd.: *See*—
Nishio, Hisaharu, 4,405,429, Cl. 204-421.000.
Nabisco Brands, Inc.: *See*—
Blain, William A., 4,405,298, Cl. 425-308.000.
Spadafora, Paul F., 4,405,650, Cl. 426-62.000.
Nadler, M. Princeton; and Miller, David, to Mosebach Electric & Supply Company. Glare susceptibility tester. 4,405,216, Cl. 351-237.000.
Nagai, Kiyoshi. Hermetically sealed flat-type piezo-electric oscillator assembly. 4,405,875, Cl. 310-344.000.
Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,405,901, Cl. 330-261.000.
Nagasawa, Takeshi: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Katuya, Michio, 4,405,227, Cl. 355-27.000.
Nagashima, Masaya. Method for erection of a temporary bridge, and a pile means therefor. 4,405,262, Cl. 405-221.000.
Nagashima, Tugio: *See*—
Sugiyama, Shigeo; Soya, Masahiro; and Nagashima, Tugio, 4,405,001, Cl. 141-220.000.
Nagatomo, Shigeru: *See*—
Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, 4,405,711, Cl. 435-4.000.
Nagaura, Tooru, to Sony Eveready Inc. Silver oxide cells. 4,405,698, Cl. 429-219.000.
Nakagawa, Hideaki: *See*—
Miwa, Yukimasa; Shimada, Takeo; Hayashi, Shigekazu; Ukita, Michito; Nakagawa, Hideaki; and Matsuura, Mitsuyuki, 4,405,774, Cl. 526-348.200.
Nakagawa, Isao: *See*—
Kudo, Mitsuru; and Nakagawa, Itao, 4,405,937, Cl. 358-40.000.
Nakahara, Yutaka: *See*—
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Nakahara, Yutaka, 4,405,736, Cl. 524-102.000.
Nakajima, Kazuhisa; Miyashita, Masahiko; Hakozaki, Susumu; and Chosakon, Yoshinori, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing acetic acid esters. 4,405,808, Cl. 560-247.000.
Nakajima, Shuichi: *See*—
Horii, Juichi; Nakajima, Shuichi; and Takahashi, Eiji, 4,404,902, Cl. 101-122.000.
Nakamura, Ichiro; Takenoshita, Mitsuaki; Ichiryu, Ken; Akasaka, Yoshimichi; and Watanabe, Haruo, to Hitachi, Ltd. Hydraulic operating apparatus. 4,404,892, Cl. 91-396.000.
Nakamura, Mitsuyoshi: *See*—
Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.
Nakamura, Tadao, to Kabushiki Kaisha Komatsu Seisakusho. Preheating system for diesel engines. 4,404,932, Cl. 123-179.00H.
Nakamura, Yukinobu: *See*—
Mitsuhashi, Yoshinobu; Shimada, Junichi; Sakurai, Kenjiro; and Nakamura, Yukinobu, 4,405,236, Cl. 356-350.000.
Nakashima, Shigeo. Apparatus for pumping a powdery or granular material. 4,405,289, Cl. 417-250.000.
Nakata, Tiaki; Kawazoe, Noriyuki; and Takenaka, Toshio, to Sumitomo Chemical Company, Ltd.; and Taoka Chemical Company, Ltd. Colored cyanoacrylate adhesive composition. 4,405,750, Cl. 524-717.000.
Nakatsukasa, Masashi: *See*—
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.
Nakaya, Keiichi; Kawanami, Kohji; and Hirata, Suekazu, to Asahi Glass Company Ltd. Process for producing anhydrous sodium carbonate crystal. 4,405,592, Cl. 423-421.000.
Nalco Chemical Company: *See*—
Krebs, Richard F.; Marek, Patrick J.; and Phillips, Kenneth G., 4,405,728, Cl. 523-336.000.
Nalewajek, David, to Allied Corporation. Recovery of gadolinium and gallium oxides. 4,405,568, Cl. 423-21.100.
Nampei, Masaru: *See*—
Etoh, Kunioni; Nampei, Masaru; and Tanaka, Shinichi, 4,405,705, Cl. 430-270.000.
Napier, John M.: *See*—
Googin, John M.; Napier, John M.; and Travaglini, Michael A., 4,405,448, Cl. 208-262.000.
Nardelli, Christy A., to Dart Industries Inc. Removal of copper contamination from tin plating baths. 4,405,412, Cl. 204-54.00R.
Naryshkin, Jury A.: *See*—
Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Astonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.
Nasalevska, Anna: *See*—
Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, 4,405,695, Cl. 429-103.000.
National Distillers and Chemical Corporation: *See*—
Goetz, Richard W., 4,405,821, Cl. 568-862.000.
Stasiunas, Carl, 4,404,985, Cl. 137-234.500.
National Instrument Co., Inc.: *See*—
Bergandy, Wieslaw, 4,405,061, Cl. 222-21.000.
National Research Development Corporation: *See*—
Fraval, Robert H.; and Oakford, Howerd P., 4,405,024, Cl. 177-200.000.
Scales, John T., 4,405,249, Cl. 401-182.000.

National Seal Company: *See—*
Hardison, Leslie C.; and Sandstrom, Kenneth A., 4,404,857, Cl. 73-827.000.

National Semiconductor Corporation: *See—*
Buurma, Gerald B.; and Jorgensen, John M., 4,405,871, Cl. 307-594.000.
Kosowsky, Lex A., 4,405,432, Cl. 204-206.000.

National Starch and Chemical Corporation: *See—*
Schoenberg, Jules E.; and Anderson, Stephen P., 4,405,770, Cl. 526-259.000.

National Steel Corporation: *See—*
Saunders, William T., 4,404,836, Cl. 72-332.000.

NCR Corporation: *See—*
Lockwood, George C., 4,405,868, Cl. 307-296.00A.

Neale, Thomas J.; Alverson, Frederick C.; and Karg, John S., to Foster Wheeler Energy Corporation. Drain and sampling valve assembly for a fluidized bed reactor. 4,405,561, Cl. 422-145.000.

Neary, Robin P.: *See—*
Carter, Leewood C.; and Neary, Robin P., 4,405,156, Cl. 281-29.000.

Negita, Moriyasu: *See—*
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.

Nelsen, Suzanne B., to GAF Corporation. Thermoplastic elastomer compositions. 4,405,749, Cl. 524-100.000.

Nelson, David A., Jr.: *See—*
Grobman, Warren D.; Nelson, David A., Jr.; and Warlaumont, John M., 4,405,238, Cl. 356-401.000.

Nelson Irrigation Corporation: *See—*
Meyer, Larry P., 4,405,085, Cl. 239-178.000.

Nelson Research & Development Company: *See—*
Rajadhyaksha, Vithal J., 4,405,616, Cl. 424-244.000.

Nelson, Stephen J., to Upjohn Company, The. Processes for making phosphorus derivatives of aminothiomethylcarbamates. 4,405,796. Cl. 549-220.000.

Nelson, Warren J., to Reynolds Metals Company. Method and apparatus for measuring ingot production. 4,405,009, Cl. 164-413.000.

Nemec, James: *See—*
Wade, Mark W., 4,404,980, Cl. 135-102.000.

Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, to Alusuisse Italia S.p.A. Catalyst for the preparation of phthalic anhydride. 4,405,505, Cl. 252-461.000.

Nestier Corporation: *See—*
Spiros, Dennis J., 4,405,052, Cl. 211-49.00D.
Stein, Eric D., 4,405,057, Cl. 220-346.000.

Neubauer, Jeffrey A.; and Sarni, Vincent A., to PPG Industries, Inc. Environmental control of needled mat production. 4,404,717, Cl. 28-107.000.

Neuzil, Richard W., to UOP Inc. Process for the separation of monosaccharides. 4,405,377, Cl. 127-46.200.

Newman, Paul: *See—*
Sargent, Raymond F.; and Newman, Paul, 4,405,134, Cl. 277-3.000.

Newsome, John R.: *See—*
Van Dongen, Robert H.; and Newsome, John R., 4,405,441, Cl. 208-61.000.

Nickel, Friedhelm; Koerner, Gotz; Schmidt, Gunter; and Rott, Hans, to Th. Goldschmidt AG. Preparation for shrinkproofing wool. 4,405,328, Cl. 8-128.00A.

Nickell, Louis G., to Velsicol Chemical Corporation. Method of increasing the yield of sugar obtained from sugar cane. 4,405,361, Cl. 71-121.000.

Niederer, Kurt W., to Terrell Machine Company, The. Apparatus for stripping residual yarn from textile bobbins or the like. 4,404,719, Cl. 28-297.000.

Nielinger, Werner; Lindner, Christian; Grigo, Ulrich; Binsack, Rudolf; Fahrler, Friedrich; and Brassat, Bert, to Bayer Aktiengesellschaft. High-impact polyamide moulding compositions. 4,405,748, Cl. 524-504.000.

Nielsen, Erik, to Daekko Presenning Kompagni A/S. Safety mat for use in protection of waterwashed areas against erosion and/or undermining. 4,405,257, Cl. 405-19.000.

Niigata Engineering Co., Ltd.: *See—*
Sakano, Takashi; and Igarashi, Mikio, 4,404,763, Cl. 37-250.000.

Nikolic, Zivomir. Four-stroke-cycle internal combustion engine with fuel injection. 4,404,938, Cl. 123-256.000.

Nilsson, Claes T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,405,546, Cl. 264-159.000.

Nippon Alumi Jutaku-Kenzai Kogyo Co., Ltd.: *See—*
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.

Nippon Aluminum Mfg. Co., Ltd., The: *See—*
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakajima, Kazuhisa; Miyashita, Masahiko; Hakozaki, Susumu; and Chosakon, Yoshinori, 4,405,808, Cl. 560-247.000.

Nippon Kogaku K.K.: *See—*
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Nippon Sheet Glass Co. Ltd.: *See—*
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,405,679, Cl. 428-216.000.

Nippon Soken, Inc.: *See—*
Akita, Sigeyuki, 4,405,896, Cl. 324-208.000.
Shinoda, Yoshio; and Kuno, Akira, 4,405,924, Cl. 340-825.720.
Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, 4,404,798, Cl. 60-296.000.

Nippon Steel Corporation: *See—*
Otoguro, Yasuo; Hashimoto, Katukuni; Takahashi, Hisashi; and Fujita, Toshio, 4,405,369, Cl. 75-126.00C.
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Fujii, Yohji; and Minowa, Junichiro, 4,405,405, Cl. 156-633.000.

Nippon Thompson, Co., Ltd.: *See—*
Sadao, Yamanaka, 4,404,774, Cl. 51-325.000.

Nippon Zeon Co., Ltd.: *See—*
Oyama, Motofumi; and Hashimoto, Kinro, 4,405,756, Cl. 525-237.000.

Nishikawa, Masaji: *See—*
Kasuga, Muneo; Nishikawa, Masaji; and Funakubo, Tomoki, 4,405,224, Cl. 355-3.00R.

Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, to Hokko Chemical Industry Co., Ltd.; and Meiji Seika Kaisha Ltd. Pyrazolylpyrimidine derivatives. 4,405,743, Cl. 424-321.000.

Nishino, Shinichi; Katagiri, Shigenobu; and Kubo, Kazuyuki, to Hitachi Koki Company, Limited. Failure detection circuit for impact printers or the like. 4,405,922, Cl. 340-825.360.

Nishio, Hisaharu, to N G K Spark Plug Co., Ltd. Oxygen detector. 4,405,429, Cl. 204-421.000.

Nissan Motor Company, Limited: *See—*
Fujikawa, Yasuo, 4,404,945, Cl. 123-478.000.
Koike, Shyouichi; Iidaka, Toshiharu; and Ohyama, Akio, 4,404,866, Cl. 74-546.000.
Masaki, Kenji, 4,404,941, Cl. 123-339.000.
Matsuoka, Hideoki, 4,405,155, Cl. 280-802.000.
Tamura, Takeo; Hara, Hiroshi; and Kido, Takayoshi, 4,405,887, Cl. 318-443.000.
Ushiro, Masayuki; and Tsubokura, Takeki, 4,404,997, Cl. 139-291.00R.
Yamane, Yukio; Yoshiyuki, Kazuhiko; and Endo, Toshiaki, 4,405,174, Cl. 296-201.000.
Yamazaki, Masafumi; and Suzuki, Mikio, 4,404,944, Cl. 123-458.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Atsumi, Shin-Ichi; Sasaki, Masayuki; and Kitamura, Ikuo, 4,405,648, Cl. 426-19.000.

Nisshin Steel Company, Ltd.: *See—*
Hoshino, Kazuo; Tanaka, Teruo; and Tachibana, Keiichi, 4,405,390, Cl. 148-37.000.

Nitschko, Theodor, to TMC Corporation. Ski binding jaw. 4,405,152, Cl. 280-625.000.

Nitta, Tsuneo; and Kasuya, Hideki, to Tokyo Shibaura Denki Kabushiki Kaisha. Phoneme information extracting apparatus. 4,405,838, Cl. 179-1.0SD.

Niveau AG, Firma: *See—*
Preusker, Werner, 4,405,006, Cl. 152-170.000.

No, Shinichiro: *See—*
Ozawa, Kazumi; and No, Shinichiro, 4,404,900, Cl. 101-40.000.

Nobutoki, Saburo, to Hitachi, Ltd. Image pickup tube faceplate structure. 4,405,938, Cl. 358-44.000.

Noe, James: *See—*
Dressler, Hans; Lederer, Donald A.; and Noe, James, 4,405,755, Cl. 525-138.000.

Noel, Alain W.: *See—*
Allart, Bernard R.; Lallier, Jean-Claude; and Noel, Alain W., 4,404,896, Cl. 91-491.000.

Nolde, Wolfgang: *See—*
Jansen, Winfried; and Nolde, Wolfgang, 4,405,835, Cl. 179-1.0GS.

Nolen, Robert L.: *See—*
Kool, Lawrence B.; Nolen, Robert L.; and Solomon, David E., 4,405,373, Cl. 106-198.000.

Nondahl, Thomas A., to General Electric Company. Rotor for a line-start permanent-magnet motor. 4,405,873, Cl. 310-156.000.

Norback, Per; and Eriksson, Borje, to AB Carl Munters. Supply device for use with evaporative contact bodies. 4,405,533, Cl. 261-111.000.

Nordson Corporation: *See—*
Wydro, Jan J.; Scholl, Charles H.; and Coker, William R., 4,405,063, Cl. 222-146.0HE.

North American Philips Consumer Electronics Corp.: *See—*
Gallaro, Anthony V.; and Hedler, Robert A., 4,405,880, Cl. 313-467.000.

Northe, Melvin M.; and Larson, Dean W., to Esco Corporation. Sling hook. 4,404,712, Cl. 24-129.00R.

Northern Telecom Inc.: *See—*
Cwirzen, Casimir, 4,405,967, Cl. 361-124.000.

Northern Telecom Limited: *See—*
Charlebois, Leonard J.; and Huszarik, Fred A., 4,405,083, Cl. 249-97.000.
Sebastien, Leslie, 4,405,410, Cl. 204-15.000.
Suthers, Mark S., 4,405,874, Cl. 310-313.00B.

Noser, Friedrich: *See*—
Rothlisberger, Rudi; and Noser, Friedrich, 4,405,645, Cl. 424-326.000.
Novo Industri A/S: *See*—
Moody, Alister J.; Thim, Lars; and Jorgensen, Karin D., 4,405,608, Cl. 424-177.000.
Novo, Mario C.: *See*—
Ide, John D.; Settlemire, David J.; and Novo, Mario C., 4,406,019, Cl. 455-245.000.
Noyes, Ronald T., to Beard Industries, Inc. Grain drying and conditioning apparatus. 4,404,756, Cl. 34-65.000.
Noyes, Steven S.: *See*—
Holtey, Thomas O.; Noyes, Steven S.; and Raymond, James C., 4,405,979, Cl. 364-200.000.
Numazawa, Akio; and Arai, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Power transmission unit for motor vehicles. 4,404,869, Cl. 74-740.000.
Nunokawa, Kazuo: *See*—
Sano, Eiichi; and Nunokawa, Kazuo, 4,405,215, Cl. 351-208.000.
Nuova Italsider S.p.A.: *See*—
Arno', Mario; and Costa, Bruno, 4,405,364, Cl. 75-52.000.
Nyman, Bjorn D.: *See*—
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Nyquist, John D.; Kwasniewski, Gary K.; Thornton, Arthur W.; Vest, Paul E.; and Ducklo, Kenneth E., to Procter & Gamble Company, The. Process for making high-glycerin soap bars. 4,405,492, Cl. 252-370.000.
O.K. Machine and Tool Corporation: *See*—
Kober, Marvin, 4,405,120, Cl. 269-71.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Ruttershoff, Heinz-Joachim, 4,405,281, Cl. 414-722.000.
Oak Industries Inc.: *See*—
Van Zeeland, Anthony J., 4,405,841, Cl. 200-11.00R.
Oakford, Howerd P.: *See*—
Fraval, Robert H.; and Oakford, Howerd P., 4,405,024, Cl. 177-200.000.
Oberem, Karl: *See*—
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, 4,404,832, Cl. 72-209.000.
Oberschelp, Heinz-Rolf: *See*—
Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, 4,404,921, Cl. 112-291.000.
Occidental Chemical Corporation: *See*—
Chao, Li-Chung; and Scharf, Daniel J., 4,405,732, Cl. 524-83.000.
Ochs, Wolfram: *See*—
Demmler, Kurt; and Ochs, Wolfram, 4,405,765, Cl. 525-506.000.
O'Donnell, John P.: *See*—
Kam, Sheung-tsam; Erhardt, Paul W.; Borgman, Robert J.; and O'Donnell, John P., 4,405,642, Cl. 424-309.000.
Oesterle, Helmut, to Hilti Aktiengesellschaft. Valve trigger assembly for pneumatic nailer. 4,404,894, Cl. 91-461.000.
Oetjen, Jurgen, to INA Walzlager Schaeffler KG. Roller bearing. 4,405,185, Cl. 308-6.00C.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Genty, Bernard; Marraud, Alain; and Valle, Roger, 4,405,865, Cl. 250-442.100.
Ogawa, Kyosuke: *See*—
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Ogawa, Masahide: *See*—
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Ogle, James W.; and Lyons, Peter B. Method for enhancing signals transmitted over optical fibers. 4,405,199, Cl. 350-96.190.
Oguchi, Yukio: *See*—
Fujii, Tetsuya; Oguchi, Yukio; Sumita, Norio; and Goto, Isamu, 4,405,295, Cl. 419-28.000.
Ohba, Hiroshi; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for taking off a band wound about a paper sheet bundle. 4,404,723, Cl. 29-33.520.
Ohlaug, Raymond O. Guiding attachment for a cutting torch. 4,405,117, Cl. 266-66.000.
Ohmori, Masahiko: *See*—
Hasui, Hiroshi; Furihata, Toshikazu; Takanashi, Kazuko; and Ohmori, Masahiko, 4,405,807, Cl. 560-75.000.
Ohno, Shigeru: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Ohno, Shigeru, 4,405,702, Cl. 430-60.000.
Ohsawa, Katsuyuki; Sugiyama, Katsuhiko; and Idota, Yoshinori, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Flowmeter. 4,404,859, Cl. 73-861.180.
Ohsawa, Mitsuo, to Sony Corporation. Electrical circuit apparatus. 4,405,971, Cl. 361-401.000.
Ohshima, Jiro: *See*—
Koshino, Yutaka; Ajima, Takashi; Ohshima, Jiro; and Abe, Masahiro, 4,404,736, Cl. 29-576.00W.
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Ohtake, Yasushi: *See*—
Inomata, Akira; Hasegawa, Tsunao; and Ohtake, Yasushi, 4,405,953, Cl. 360-65.000.
Ohtsu, Shinji, to Denki Onkyo Company Limited. Convergence apparatus for color cathode-ray tube. 4,405,910, Cl. 335-210.000.
Ohyama, Akio: *See*—
Koike, Shyonichi; Iidaka, Toshiharu; and Ohyama, Akio, 4,404,866, Cl. 74-546.000.
Ohyama, Hiroshi: *See*—
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Ohyama, Taketomo, to MCC Corporation. Pipe thread cutting and assembly machine. 4,404,721, Cl. 29-33.00T.
Ohyama, Yoshishige: *See*—
Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, 4,404,846, Cl. 73-118.000.
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Power control circuit for a magnetron oscillator. 4,405,904, Cl. 331-87.000.
Oikawa, Yuji: *See*—
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Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,849, Cl. 73-146.000.
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of and apparatus for reducing emitted amount of particulates contained in exhaust gas of diesel engine. 4,404,795, Cl. 60-274.000.
Oishi, Kiyohiko: *See*—
Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, 4,404,798, Cl. 60-296.000.
Okabe, Nobuo: *See*—
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Okamoto, Eiji, to Gadelius K.K. Rotary type heat pipe heat exchanger. 4,405,013, Cl. 165-86.000.
Okamoto, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Brushless dc motor. 4,405,885, Cl. 318-254.000.
Okamoto, Masayoshi: *See*—
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Okkerse, Simon W. J. H.: *See*—
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Okorodudu, Abraham O. M., to Mobil Oil Corporation. Phosphorodithioate products of hydrocarbyl imino-methylene-substituted hindered phenols. 4,405,470, Cl. 252-32.70E.
Okuda, Haruo: *See*—
Matsunaga, Mamoru; Usami, Teruo; Okuda, Haruo; and Futamata, Hideo, 4,405,376, Cl. 106-300.000.
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Olin Corporation: *See*—
Deininger, J. Paul; and Dotson, Ronald L., 4,405,573, Cl. 423-150.000.
Gray, Thomas J., 4,405,434, Cl. 204-293.000.
Lines, Ellwood L., Jr.; and Farmer, Douglas A., Jr., 4,405,076, Cl. 229-3.5MF.
Moore, Sanders H.; and Dotson, Ronald L., 4,405,465, Cl. 210-757.000.
Mravic, Brian; and Shapiro, Eugene, 4,405,386, Cl. 148-11.50A.
Olin, George R.: *See*—
Williams, David J.; Meredith, Gerald R.; and Olin, George R., 4,405,733, Cl. 524-87.000.
Oliver, David W., to United States of America, Army. Bonded grid-cathode electrode structure. 4,405,878, Cl. 313-346.00R.
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Wunderlich, Klaus; Schlegel, Udo; and Ricke, Heinz, 4,405,248, Cl. 400-550.000.
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Kambara, Koji, 4,404,964, Cl. 128-4.000.
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Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.

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Busca, Giovanni; and Johnson, Leland, 4,405,905, Cl. 331-94.100.

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Vande Woude, George F.; McClements, William L.; Oskarsson, Marianne K.; and Blair, Donald G., 4,405,712, Cl. 435-5.000.

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Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.

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Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,405,667, Cl. 428-35.000.

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Canalizo, Carlos R., 4,405,291, Cl. 417-393.000.

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Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.

Ou, Sam A., to BS&B Safety Systems, Ltd. Rupturable pressure relief apparatus. 4,404,982, Cl. 137-68.00R.

Overstreet, Scott M.; and Swenson, C. Henning, to GTE Products Corporation. Power supply for repetitive discharge apparatus. 4,405,889, Cl. 320-1.000.

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Propster, Mark A., 4,405,350, Cl. 65-27.000.
Sheinkop, Isac M., 4,405,351, Cl. 65-29.000.

Owsianny, Edmund, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Gas turbine construction and method of controlling the labyrinth seal clearance automatically and continuously. 4,405,283, Cl. 415-14.000.

Oyama, Motofumi; and Hashimoto, Kinro, to Nippon Zeon Co., Ltd. Co-vulcanizable rubber composition. 4,405,756, Cl. 525-237.000.

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Clayman, John M.; and Weiner, Norman, 4,404,702, Cl. 12-146.00S.

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Turnquist, Edwin W.; and Bentley, Rick J., 4,404,891, Cl. 91-45.000.

Paciorek, Leonard J.: *See*—
Gerst, Carl W.; Paciorek, Leonard J.; and Sly, Thomas L., 4,405,895, Cl. 324-83.00D.

Paddock, Stephen W.; and Tate, Ralph, Jr., to Whirlpool Corporation. Door mounted electronic housing assembly for a refrigerator. 4,404,813, Cl. 62-127.000.

Padilla, Antonio A.: *See*—
Rodriguez, Larry A.; Padilla, Antonio A.; Ashworth, Robert A.; and Spake, Ned B., 4,405,332, Cl. 44-51.000.

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Fisher, E. Eugene; Estes, R. Ray; Lokken, Orrin D.; and Paguette, Elmer G., 4,405,647, Cl. 426-4.000.

Palitex Project-Company GmbH: *See*—
Scheufeld, Heinz; and Lossa, Ulrich, 4,405,094, Cl. 242-149.000.

Palm, Dieter. Method of generating energy from different water levels. 4,404,801, Cl. 60-496.000.

Palma, James D.; and Seino, Michael J., to General Motors Corporation. Solenoid assembly and method of making same. 4,405,912, Cl. 335-260.000.

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Palopoli, Frank P.: *See*—
Dage, Richard C.; Palopoli, Frank P.; Schnettler, Richard A.; and Grisar, J. Martin, 4,405,628, Cl. 424-263.000.

Pampalone, Thomas R.; and Kilichowski, Kurt B., to RCA Corporation. Positive radiation sensitive resist terpolymer from omega alkynoic acid. 4,405,776, Cl. 528-364.000.

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Ray, Ranjan; Panchanathan, Viswanathan; and Giessen, Bill C., 4,405,368, Cl. 75-124.000.

Pankowski, Richard A.: *See*—
Reichert, Gilbert A.; and Pankowski, Richard A., 4,405,826, Cl. 174-59.000.

Pape, Wilhelm, to Wabco Fahrzeugbremsen GmbH. Compressor. 4,405,293, Cl. 417-482.000.

Papermaster, Ben W.: *See*—
McEntire, John E.; and Papermaster, Ben W., 4,405,601, Cl. 424-95.000.

Parikh, Bhupendra A., to MTD Products Inc. Variable speed driving mechanism. 4,404,864, Cl. 74-197.000.

Parker, Alan; and Clough, Douglas O. Friction spinning apparatus. 4,404,792, Cl. 57-401.000.

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Busse, Oswald; and Klesper, Hugo, 4,405,457, Cl. 210-225.000.

Pasternack, Adalbert, to Dragerwerk AG. Cooling device particularly for heat protective suits. 4,405,348, Cl. 62-259.300.

Patel, Vishnubhai V.: *See*—
Engler, Edward M.; Patel, Vishnubhai V.; and Schumaker, Robert R., 4,405,515, Cl. 260-239.00R.

Patterson, Richard A., to Minnesota Mining & Manufacturing Company. Container closure system with vent opening through the closure tape. 4,405,056, Cl. 220-271.000.

Patton, Edward J.: *See*—
Blaustein, Eric W.; and Patton, Edward J., 4,405,331, Cl. 44-1.00D.

Paulik, John R.: *See*—
Kulpa, Walter J.; and Paulik, John R., 4,405,125, Cl. 271-195.000.

Paulin, Stephen V.; Hillard, Randy H.; and Youngers, Stephen A., to J. I. Case Company. Digging tooth mounting bracket. 4,404,761, Cl. 37-191.00A.

Payne, Arnold F.; Mauro, Gene A.; Cumpton, Wayne L.; and Orr, George J. Overhead ambulance attendant stabilizing device. 4,405,171, Cl. 296-19.000.

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Payne, John R., to Kaiser Aluminum & Chemical Corporation. Aluminum reduction cell electrode. 4,405,433, Cl. 204-225.000.

Peake, Gilbert R. Fuel tank drain kit and process. 4,405,048, Cl. 206-582.000.

Peavey Electronics Corp.: *See*—
Sondermeyer, Jack C., 4,405,832, Cl. 179-1.00D.

Pelizzetti, Ezio: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Borgarello, Enrico; and Pelizzetti, Ezio, 4,405,424, Cl. 204-157.10R.

Penney, Edison P. Gas energized engine system. 4,404,800, Cl. 60-370.000.

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Perez-Mendez, Pedro I., to Bell Telephone Laboratories, Incorporated. Auxiliary memory for microprocessor stack overflow. 4,405,983, Cl. 364-200.000.

Perot, Francois; Pouderoux, Jacqueline; and Diez, Jacques, to Stein Industrie. Method of evaporating a pure liquid. 4,404,928, Cl. 122-32.000.

Perrault, Eric P., to Snellman, Donald L. Collator. 4,405,225, Cl. 355-14.00R.

Perrot, Jacques; and Thominet, Michel, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France. N-(1-Allyl-2-pyrrolidinylmethyl)2-methoxy-4-amino-5-methylsufamoyl benzamide, its method of preparation and its use as a medicament. 4,405,636, Cl. 424-274.000.

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Manson, Mans O.; Sjogreen, Carl-Axel E.; and Bergvall, Goran A., 4,405,471, Cl. 252-34.000.

Peterle, Leonardo: *See*—
Lebet, Jean-Philippe; Peterle, Leonardo; and Matthe-Doret, Fernand, 4,404,741, Cl. 29-721.000.

Peters, Joseph H., to U.S. Philips Corporation. Method of and arrangement for digitizing a color video signal. 4,405,936, Cl. 358-13.000.

Petersen-Hoj, Peter, to Tetra Pak Developpement SA. Laminated material. 4,405,400, Cl. 156-244.110.
Peterson, John A.: *See—*
Bell, Frank H.; and Peterson, John A., 4,404,911, Cl. 102-221.000.
Petinaux, Marcel: *See—*
Wegener, Gerhard; Knofel, Hartmut; Ellendt, Gunther; and Petinaux, Marcel, 4,405,527, Cl. 260-453.0PH.
Petzold, James R.: *See—*
Miller, Jesse D., Jr.; and Petzold, James R., 4,405,657, Cl. 427-54.100.
Peyton, Ronald G.: *See—*
Mclaughlin, Thomas M.; McLeod, William D.; Madsen, Nels H.; and Peyton, Ronald G., 4,405,128, Cl. 272-117.000.
Pfahler, Gerhard: *See—*
Wiezer, Hartmut; Pfahler, Gerhard; and Korbanka, Helmut, 4,405,735, Cl. 524-95.000.
Pfeifer, Alfred; Seif, Rudolf; and Holdt, Dietmar, to Degussa Aktiengesellschaft. Apparatus for partial electrolytic coating of individual metal parts. 4,405,431, Cl. 204-202.000.
Pfeiffer, Gerd; Biller, Horst; Bellmann, Manfred; Oberem, Karl; Lampe, Alfred; and Frentzen, Hermann-Josef, to Mannesmann Aktiengesellschaft. Operating a rolling mill working on seamless tubing. 4,404,832, Cl. 72-209.000.
Pfeuffer, Alfred: *See—*
Baier, Alfred; Lucht, Alfred; Munch, Gerhard; and Pfeuffer, Alfred, 4,405,382, Cl. 148-9.00R.
Pfizer Inc.: *See—*
Johnson, Michael R., 4,405,626, Cl. 424-258.000.
Pfuhl, Ingrid: *See—*
Pfuhl, Jakob, 4,404,920, Cl. 112-121.150.
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Pfuhl, Katarina: *See—*
Pfuhl, Jakob, 4,404,920, Cl. 112-121.150.
Phalin, Thomas L., to American Can Company. Container. 4,405,058, Cl. 220-458.000.
Pharmindustrie: *See—*
Champseix, Alain A.; and Le Fur, Gerard R., 4,405,789, Cl. 546-176.000.
Philip Morris Inc.: *See—*
Stewart, Lawrence L., Jr., 4,404,976, Cl. 131-339.000.
Phillips, Kenneth G.: *See—*
Krebs, Richard F.; Marek, Patrick J.; and Phillips, Kenneth G., 4,405,728, Cl. 523-336.000.
Phillips, Leslie N.: *See—*
Murphy, David J.; and Phillips, Leslie N., 4,405,543, Cl. 264-123.000.
Phillips Petroleum Company: *See—*
Beever, William H.; and Brady, Donnie G., 4,405,767, Cl. 525-537.000.
Mathis, Ronald D.; and Reed, Jerry O., 4,405,745, Cl. 524-429.000.
McDaniel, Max P., 4,405,768, Cl. 526-96.000.
Moczygemba, George A.; and Udipi, Kishore, 4,405,754, Cl. 525-102.000.
Stapp, Paul R., 4,405,567, Cl. 423-17.000.
Witt, Donald R., 4,405,501, Cl. 252-452.000.
Phillips Plastics Corporation: *See—*
Wollar, Burnell J., 4,405,272, Cl. 411-41.000.
Photon Power, Inc.: *See—*
Singh, Vijay P., 4,404,734, Cl. 29-572.000.
Piano, Renzo, to Fiat Auto S.p.A. Motor vehicle door assembly. 4,405,173, Cl. 296-146.000.
Pick, George G.; and Rasekhi, Foushang, to Wang Laboratories, Inc. Magnetographic recording heads. 4,405,960, Cl. 360-125.000.
Pickering, William; and Urbanc, David J., to Caterpillar Tractor Co. Apparatus for determining the ratio of two signal repetition rates. 4,405,990, Cl. 364-703.000.
Piegay, Yves, to Skis Rossignol S.A. Ski with vibration-damping means. 4,405,149, Cl. 280-602.000.
Piesik, Edward T., to General Dynamics, Pomona Division. Recoil reducer. 4,404,887, Cl. 89-1.816.
Pigney, Keith D.: *See—*
Stuck, Earl N.; Pigney, Keith D.; and Gifford, Howard, 4,405,296, Cl. 425-6.000.
Pilkington, Roger: *See—*
O'Rourke, Cameron; and Pilkington, Roger, 4,405,258, Cl. 405-60.000.
Pioneer Electronic Corporation: *See—*
Inomata, Akira; Hasegawa, Tsunao; and Ohtake, Yasushi, 4,405,953, Cl. 360-65.000.
Motohashi, Minoru, 4,406,018, Cl. 455-164.000.
Pippard, David A., to British Petroleum Company Limited, The. Corrosion inhibitors, method of producing them and protective coatings containing them. 4,405,493, Cl. 252-389.00A.
Pistoia, Gianfranco: *See—*
Moshtev, Raphael; Pistoia, Gianfranco; Manev, Veselin; and Nasalevska, Anna, 4,405,695, Cl. 429-103.000.
Pitney Bowes Inc.: *See—*
Kulpa, Walter J.; and Paulik, John R., 4,405,125, Cl. 271-195.000.
Pitts, Warren R.: *See—*
Jodrey, Robert M.; and Pitts, Warren R., 4,405,301, Cl. 432-124.000.
Plastics Engineering Company: *See—*
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,519, Cl. 548-423.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,520, Cl. 548-423.000.
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D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,786, Cl. 546-66.000.
Lee, Chung J., 4,405,741, Cl. 524-299.000.
Pless, Janos: *See—*
Cardinaux, Francois; Hugnenin, Rene; and Pless, Janos, 4,405,607, Cl. 424-177.000.
PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,405,546, Cl. 264-159.000.
Plotkin, Neil D.: *See—*
Lowery, James J.; Plotkin, Neil D.; and Robinson, Jack, 4,405,688, Cl. 428-398.000.
Poclain Hydraulics: *See—*
Allart, Bernard R.; Lallier, Jean-Claude; and Noel, Alain W., 4,404,896, Cl. 91-491.000.
Pohl, Daniel P., to Minnesota Mining & Manufacturing Company. Decorative ribbon or sheet material. 4,405,676, Cl. 428-164.000.
Poisson, Paul. Apparatus for recording identifying data concerning the use of a credit card, cheque or the like. 4,405,856, Cl. 235-381.000.
Polanek, Edward L.: *See—*
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,405,984, Cl. 364-410.000.
Polaroid Corporation: *See—*
Bader, Henry; and Chiang, Yunn H., 4,405,781, Cl. 544-264.000.
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,405,788, Cl. 546-165.000.
Poleshuk, Michael, to Xerox Corporation. Method of forming a thin film transistor. 4,404,731, Cl. 29-571.000.
Pollock, Elisabeth M., to Extracorporeal Medical Specialties, Inc. Method for inhibiting mineralization of natural tissue during implantation. 4,405,327, Cl. 8-94.110.
Polyakov, Lev V.: *See—*
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latesko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.
Polymer Corporation, The: *See—*
Swavely, Donald F., 4,405,969, Cl. 361-215.000.
Polytronic AG: *See—*
Thalmann, Claude, 4,405,132, Cl. 273-348.100.
Poris, Jaime: *See—*
Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A., 4,405,416, Cl. 204-68.000.
Porter, Charles: *See—*
Rogers, Jack M.; Tokosh, Richard; Porter, Charles; and Martine, James, 4,405,509, Cl. 252-522.00A.
Possis Medical, Inc.: *See—*
Titus, John S., 4,404,974, Cl. 128-670.000.
Possl, Hans, to Wyder AG. Magnetic tape cassette. 4,405,096, Cl. 242-199.000.
Post Office: *See—*
Foster, Robert A. L.; and Childs, Geoffrey H. L., 4,405,830, Cl. 178-30.000.
Postenrieder, Erwin: *See—*
Kutzner, Luitpold; and Postenrieder, Erwin, 4,404,956, Cl. 126-293.000.
Pott, Richard, to Koninklijke Textielfabrieken Nijverdal-Ten Cate N.V. Laminate reinforcement for fibre-reinforced synthetic resins. 4,405,669, Cl. 428-61.000.
Potter, Emerson L., to Eli Lilly and Company. Combination and method for increasing feed utilization efficiency in ruminants. 4,405,609, Cl. 424-177.000.
Potter, Keith E., to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Methods and apparatus for warning aircraft of the presence and direction of electrical transmission lines. 4,405,926, Cl. 343-123.000.
Pouderoux, Jacqueline: *See—*
Perot, Francois; Pouderoux, Jacqueline; and Diez, Jacques, 4,404,928, Cl. 122-32.000.
Powell, Andrian J. C.: *See—*
Powell, John E.; and Powell, Andrian J. C., 4,405,265, Cl. 405-109.000.
Powell, John E.; and Powell, Andrian J. C., to Beloit Corporation. Method and apparatus for the continuous transfer of particulates from a liquid conveying medium to a gaseous conveying medium. 4,405,265, Cl. 406-109.000.
PPG Industries, Inc.: *See—*
Bloss, Karl H.; and Stewart, Royann L., 4,405,352, Cl. 65-99.400.
Castellucci, Nicholas T.; Grunewalder, John F.; and Ostrowski, John S., 4,405,428, Cl. 204-181.00R.
Girgis, Mikhail M., 4,405,746, Cl. 524-501.000.
Jagtap, Asvinkumar N., 4,405,759, Cl. 525-356.000.
Neubauer, Jeffrey A.; and Sarni, Vincent A., 4,404,717, Cl. 28-107.000.
Prefco Products, Inc.: *See—*
McCabe, Francis J., 4,404,990, Cl. 137-601.000.
Preusker, Werner, to Niveau AG, Firma. Anti-skidding device for tired, particularly pneumatic-tired vehicle wheels on ice and snow. 4,405,006, Cl. 152-170.000.

Previte, Robert W.: *See*—
Serafin, Frank G.; Previte, Robert W.; Greening, Nathan R.; Kantro, David L.; and Tang, Fulvio J., 4,405,372, Cl. 106-90.000.

Price, Cosby G. Drive system for electric vehicles. 4,405,028, Cl. 180-65.00E.

Price, Frank C.: *See*—
Berrill, William H.; and Price, Frank C., 4,404,700, Cl. 12-12.000.

Price, Jean L.: *See*—
Jeffreys, George A.; Tobey, James F., Jr.; and Price, Jean L., 4,405,649, Cl. 426-59.000.

Priester, Handy C.: *See*—
Wills, David V.; and Wills, Angela B., 4,404,764, Cl. 40-124.100.

Prince, Richard J.: *See*—
Barclay, John L.; Hargrove, John D.; and Prince, Richard J., 4,405,503, Cl. 252-455.00Z.

Prisant, Millard B.: *See*—
Hall, Eldon C.; Seward, Harold H.; Sabo, Joseph D.; De Marco, Vincent R.; and Prisant, Millard B., 4,405,985, Cl. 364-423.000.

Pritchard, Robert W.; Drozd, Edward J.; and Lutz, Michael K., to Beecham Inc. Medicated disposable douche product. 4,405,306, Cl. 604-87.000.

Pritzkow, Dennis H.; Zabel, Jack H.; and Lang, George R., to General Electric Company. Detector array retaining and positioning system. 4,405,863, Cl. 250-385.000.

Procon International Inc.: *See*—
Trager, John E., 4,405,449, Cl. 208-350.000.

Procter & Gamble Company, The: *See*—
Frohwerk, Arthur E.; and Enting, David E., 4,404,879, Cl. 83-22.000.
Kuzel, Maryann; and Leikhim, John W., 4,405,483, Cl. 252-140.000.
Nyquist, John D.; Kwasniewski, Gary K.; Thornton, Arthur W.; Vest, Paul E.; and Ducklo, Kenneth E., 4,405,492, Cl. 252-370.000.

Propster, Mark A., to Owens-Corning Fiberglas Corporation. Drying and preheating agglomerates containing clay having coarse particle size. 4,405,350, Cl. 65-27.000.

Puccini, Sergio E.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., 4,406,005, Cl. 370-63.000.

Pulcrano, Frank C.: *See*—
Fritzsche, Eldred N.; Josephson, Edgar F.; and Pulcrano, Frank C., 4,405,168, Cl. 294-103.00R.

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Dassler, Armin A., 4,404,759, Cl. 36-129.000.

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Purdue Research Foundation: *See*—
Leidenfrost, Wolfgang, 4,404,855, Cl. 73-747.000.

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Everett, George S., 4,405,726, Cl. 523-144.000.

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Kling, Rudolf; and Scheider, Bernd, 4,405,859, Cl. 250-229.000.

Quilliam, Robert M., to Marconi Company Limited, The. Piezoelectric/pyroelectric elements. 4,405,402, Cl. 156-273.700.

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Racz, Istvan: *See*—
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Takahashi, Kozo, 4,406,017, Cl. 455-137.000.

Radish, Madeline L., to Longbrake, Howard Ray. Blade sharpener. 4,404,873, Cl. 76-82.000.

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Siddens, Jack K.; and Raghu, Sivaraman, 4,405,529, Cl. 260-465.00F.

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Evertz, Egon; and Rahn, Helmut, 4,405,383, Cl. 148-9.500.

Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A. Molten salt lithium cells. 4,405,416, Cl. 204-68.000.

Rajadhyaksha, Vithal J., to Nelson Research & Development Company. Penetration enhancers for transdermal drug delivery of systemic agents. 4,405,616, Cl. 424-244.000.

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Cavazza, Claudio; Carloni, Massimo; and Ramacci, Maria T., 4,405,638, Cl. 424-275.000.

Raman, Ramaswamy V.; and Maringer, Robert E., to Battelle Memorial Institute. Preparation of rapidly solidified particulates. 4,405,535, Cl. 264-11.000.

Rampel, Guy, to General Electric Company. Electrode coating composed of copolymers derived from diacetone acrylamide. 4,405,700, Cl. 429-248.000.

Rampin, Pierre: *See*—
Forster, Michel; Jaouen, Adrien; Jorda, Alain; and Rampin, Pierre, 4,405,988, Cl. 364-502.000.

Rance, John E., to Gulton Industries, Inc. Pulse width regulator. 4,405,893, Cl. 323-271.000.

Rando Machine Corporation: *See*—
Wood, Dennis E., 4,404,710, Cl. 19-105.000.

Rannenberg, George C., to United Technologies Corporation. Pneumatic supply system having variable geometry compressor. 4,405,290, Cl. 417-282.000.

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Giacchetti, Giancarlo; Ransch, Jurgen; and Walker, Clive T., 4,405,861, Cl. 250-305.000.

Rao, Manjeshwar S.: *See*—
Allen, Robert J.; Blake, Edward W.; Rao, Manjeshwar S.; and Hahn, Kurt L., 4,404,837, Cl. 72-349.000.

Rapkin, Myron C.; and Tabb, David L., to Miles Laboratories, Inc. Method and composition for urobilinogen control standard. 4,405,718, Cl. 436-8.000.

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Pick, George G.; and Rasekhi, Houshang, 4,405,960, Cl. 360-125.000.

Rassieur, Charles L., to Central Mine Equipment Company. Automatic drive hammer system. 4,405,020, Cl. 173-89.000.

Raudenbusch, Werner T.; Barnhoorn, Adrianus J. M.; Kooijmans, Petrus G.; Sederel, Willem L.; Van Steenis, Adrianus M. C.; and Schets, Theresia F. M., to Shell Oil Company. Thermosetting resinous binder compositions and their use as coating materials. 4,405,662, Cl. 427-386.000.

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Raya, Ruben N. Demountable carrier rack assembly for pickup truck. 4,405,170, Cl. 296-10.000.

Raybend Associates: *See*—
Zinn, Michael; Bauch, Tamil D.; and Schiff, Morton, 4,404,962, Cl. 126-450.000.

Raymond, James C.: *See*—
Holtey, Thomas O.; Noyes, Steven S.; and Raymond, James C., 4,405,979, Cl. 364-200.000.

Raynes, Edward P.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,405,211, Cl. 350-349.000.

Raytheon Company: *See*—
Edgar, Richard H., 4,405,850, Cl. 219-10.55A.

RCA Corporation: *See*—
Avery, Leslie R., 4,405,933, Cl. 357-13.000.
Breese, Maurice E.; and Robinson, Arthur S., 4,405,907, Cl. 333-24.100.
Coutts, Maurice D.; and Matthies, Dennis L., 4,405,541, Cl. 264-107.000.
del Rio, Eddy H., 4,405,864, Cl. 250-441.100.
Griffis, Patrick D., 4,405,948, Cl. 358-198.000.
Knight, Stanley P., 4,405,946, Cl. 358-192.100.
Labib, Mohamed E., 4,405,670, Cl. 428-64.000.
Pampalone, Thomas R.; and Kilichowski, Kurt B., 4,405,776, Cl. 528-364.000.
Stewart, Roger G., 4,405,996, Cl. 365-203.000.
Tults, Juri; and French, Michael P., 4,405,947, Cl. 358-193.100.
Wardell, Myron H., Jr., 4,405,950, Cl. 358-248.000.
Wine, Charles M., 4,406,002, Cl. 369-220.000.

Recker, Klaus; Reinecke, Gerd; Awater, Albert; Grogler, Gerhard; and Kraft, Karl J., to Bayer Aktiengesellschaft. Process for producing fiber-reinforced molded products. 4,405,752, Cl. 524-847.000.

Redlake Corporation: *See*—
Brant, Gordon W., 4,405,217, Cl. 352-84.000.

Reed, Jerry O.: *See*—
Mathis, Ronald D.; and Reed, Jerry O., 4,405,745, Cl. 524-429.000.

Reeder, Kevin J.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; Reeder, Kevin J.; and Hontz, Thomas D., 4,404,698, Cl. 5-507.000.

Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., to Intel Corporation. Multiple bit output dynamic random-access memory. 4,406,013, Cl. 377-29.000.

Reichert, Gilbert A.; and Pankowski, Richard A., to Allen-Bradley Company. Enclosure sealing well construction. 4,405,826, Cl. 174-59.000.

Reichhold Chemicals, Incorporated: *See*—
Cohen, Arnold, 4,405,730, Cl. 524-35.000.

Reilly Tar & Chemical Corp.: *See*—
McGill, Charles K.; and Bailey, Thomas D., 4,405,790, Cl. 546-304.000.

Reindel, John, to United States of America, Navy. Millimeter wave printed circuit mixer. 4,406,020, Cl. 455-327.000.

Reinecke, Gerd: *See*—
Recker, Klaus; Reinecke, Gerd; Awater, Albert; Grogler, Gerhard; and Kraft, Karl J., 4,405,752, Cl. 524-847.000.

Reinking, Klaus: *See—*
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Reinsch, Stephen J., to Hughes Aircraft Company. Air flow sensor. 4,405,882, Cl. 315-118.000.
Reintjes, John F.: *See—*
Manuccia, Thomas J.; and Reintjes, John F., 4,405,237, Cl. 356-301.000.
Renal Systems, Inc.: *See—*
Cosentino, Louis C., 4,405,319, Cl. 604-175.000.
Cracauer, Raymond F.; Fuller, Larry E.; Martinez, Felix J.; and Cosentino, Louis C., 4,405,320, Cl. 604-175.000.
Renker, Hansjorg, to Fritz Studer AG. Surface plate and slideway elements. 4,405,683, Cl. 428-323.000.
Repas, Paul E., to United States Steel Corporation. Strengthening response in columbium-containing high-strength low-alloy steels. 4,405,388, Cl. 148-36.000.
Republic Steel Corporation: *See—*
Demianczuk, Dionisyj W.; and Bingel, Carl J., 4,405,381, Cl. 148-2.000.
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., 4,405,380, Cl. 148-2.000.
Kinkelaar, Edmund W.; and Golar, Paul, 4,405,663, Cl. 427-428.000.
Resch, Reinhard; and Krohn, Hellmut, to Daimler-Benz Aktiengesellschaft. Brake valve. 4,405,181, Cl. 303-9.000.
Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Vehicle brake valve with an emergency piston. 4,405,183, Cl. 303-119.000.
Research Development Cooperation of Japan: *See—*
Goto, Norio, 4,404,852, Cl. 73-599.000.
Resneau, Jean C.; Doyen, Jean; and Ribier, Robert, to Thomson-CSF. Process for sealing VHF component in case. 4,404,745, Cl. 29-841.000.
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Reuther, Hellmut: *See—*
Hirsch, Bodo; Horn, Gunter; and Reuther, Hellmut, 4,405,801, Cl. 556-422.000.
Reynolds Metals Company: *See—*
Nelson, Warren J., 4,405,009, Cl. 164-413.000.
Rice, Richard M.; and Hartman, Stanley M., 4,405,894, Cl. 323-340.000.
Rhone-Poulenc, Inc.: *See—*
Giacobbe, Thomas J.; and Tsien, Grace, 4,405,805, Cl. 560-21.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Grosbois, Jean; and Dumousseau, Jean-Yves, 4,405,591, Cl. 423-347.000.
Simon, Gerard; and Soldat, Andre, 4,405,590, Cl. 423-347.000.
Ribier, Robert: *See—*
Resneau, Jean C.; Doyen, Jean; and Ribier, Robert, 4,404,745, Cl. 29-841.000.
Rice, Richard M.; and Hartman, Stanley M., to Reynolds Metals Company. Voltage control and balancing circuit. 4,405,894, Cl. 323-340.000.
Richardson-Vicks Pty. Limited: *See—*
Hayes, Russell A.; and Duve, Gerard, 4,405,482, Cl. 252-99.000.
Ricke, Heinz: *See—*
Wunderlich, Klaus; Schlegel, Udo; and Ricke, Heinz, 4,405,248, Cl. 400-550.000.
Ricoh Company, Ltd.: *See—*
Fukushima, Takashi, 4,405,245, Cl. 400-144.200.
Sugano, Osamu, 4,405,929, Cl. 346-76.0PH.
Suzaki, Masayuki, 4,405,246, Cl. 400-144.200.
Rieckenberg, Ivan L. Hand tool for mounting an electrical box. 4,404,751, Cl. 33-180.00R.
Riederer, Wolfgang: *See—*
Bayerle, Armin; Holz, Karl-Heinz; Luke, Johannes; and Riederer, Wolfgang, 4,404,957, Cl. 126-419.000.
Riegel Textile Corporation: *See—*
Teed, Richard K., 4,405,397, Cl. 156-164.000.
Rieger, Franz: *See—*
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,404,841, Cl. 73-35.000.
Ries, Donald L., to Rockwell International Corporation. Wheel hub and spindle seal. 4,405,135, Cl. 277-11.000.
Riker Laboratories, Inc.: *See—*
Thiel, Charles G., 4,405,612, Cl. 424-183.000.
Ringstad, Ralph H.: *See—*
Moakler, William A.; and Ringstad, Ralph H., 4,405,867, Cl. 307-64.000.
Rinno, Helmut: *See—*
Ehmann, Werner; and Rinno, Helmut, 4,405,747, Cl. 524-503.000.
Ritchie, Leon T.: *See—*
Douty, George H.; Ritchie, Leon T.; and Snyder, Clair W., Jr., 4,405,189, Cl. 339-17.00C.
Riva, Ermete: *See—*
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Rivest, Ronald L.; Shamir, Adi; and Adleman, Leonard M., to Massachusetts Institute of Technology. Cryptographic communications system and method. 4,405,829, Cl. 178-22.100.
Roantree, Michael L.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Nitro-substituted dihydropyrroles and tetrahydropyridines, compositions, compounds, and medicinal use. 4,405,624, Cl. 424-256.000.
Robert Bosch GmbH: *See—*
Franke, Horst; Linder, Ernst; Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,404,841, Cl. 73-35.000.
Robert, Edgardo J., to Pennsylvania Engineering Corporation. Method for the fabrication of special steels in metallurgical vessels. 4,405,365, Cl. 75-60.000.
Roberts, Clifford J.: *See—*
Whalen, Bernard F.; and Roberts, Clifford J., 4,404,918, Cl. 111-85.000.
Robinson, Arthur S.: *See—*
Breese, Maurice E.; and Robinson, Arthur S., 4,405,907, Cl. 333-24.100.
Robinson, Jack: *See—*
Lowery, James J.; Plotkin, Neil D.; and Robinson, Jack, 4,405,688, Cl. 428-398.000.
Roccaforte, Harry L, to Champion International Corporation. Dispenser carton with improved end closure. 4,405,066, Cl. 225-43.000.
Roccaforte, Harry L: *See—*
Dutcher, Daniel P.; and Roccaforte, Harry L, 4,405,078, Cl. 229-52.00B.
Rockwell International Corporation: *See—*
Eden, Richard C., 4,405,870, Cl. 307-446.000.
Johnson, Robert A.; and Havens, Donald P., 4,405,909, Cl. 333-198.000.
Mitchell, Daniel M.; and Durspek, William J., 4,405,976, Cl. 361-72.000.
Ries, Donald L., 4,405,135, Cl. 277-11.000.
Sullivan, William C., 4,404,725, Cl. 29-252.000.
Roddy, Robert L., to Combustion Engineering, Inc. Structure for aligning and butt-welding tube ends. 4,405,075, Cl. 228-49.00B.
Rodgers, Stephen D.; Dick, Richard J.; and McGinniss, Vincent D., to Battelle Development Corporation. Non-emissive, flame-retardant coating compositions. 4,405,761, Cl. 525-404.000.
Rodriguez, Larry A.; Padilla, Antonio A.; Ashworth, Robert A.; and Spake, Ned B. Alternative fuel comprised of sewage sludge and a particulate solid fuel. 4,405,332, Cl. 44-51.000.
Rogers, Alfred N. Control of silica scaling in industrial processes. 4,405,461, Cl. 210-698.000.
Rogers, Jack M.; Tokosh, Richard; Porter, Charles; and Martine, James, to Avon Products, Inc. Fragrance-emitting compositions and articles. 4,405,509, Cl. 252-522.00A.
Rohm and Haas Company: *See—*
Smolanoff, Joel, 4,405,630, Cl. 424-267.000.
Rohr, Wolfgang: *See—*
Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, 4,405,358, Cl. 71-98.000.
Rolls Royce Limited: *See—*
Payne, Charles E. G.; Jones, Thomas I. Y.; and Dootson, Peter A., 4,404,797, Cl. 60-39.281.
Sargent, Raymond F.; and Newman, Paul, 4,405,134, Cl. 277-3.000.
Romaine, John W. Cold compress. 4,404,820, Cl. 62-530.000.
Roman, Walter C., to BancOhio National Bank. Air separation apparatus and system. 4,405,451, Cl. 209-136.000.
Romanski, John G.: *See—*
Woolfson, Martin G.; and Romanski, John G., 4,405,940, Cl. 358-93.000.
Root, Stephen J.; and Kramer, Charles F., to Steel Heddle Manufacturing Co. Squeeze rod hook. 4,404,994, Cl. 139-91.000.
Rosen, Josh: *See—*
Blau, Jonathan S.; and Rosen, Josh, 4,405,992, Cl. 364-748.000.
Rosenkrands, Johannes W., to General Motors Corporation. Hinge connection for articulated vehicles. 4,405,143, Cl. 280-403.000.
Rossiter, Val J. Liquid cell for spectroscopic analysis. 4,405,235, Cl. 356-246.000.
Rossmann, Dieter, to Carl Zeiss-Stiftung. Adjustable mechanism for a photo objective. 4,405,205, Cl. 350-255.000.
Rother, Bruno; and Trommen, Hartmut, to G. A. Pfleiderer GmbH & Co., KG. Process for fastening a base plate to a pole prepared by centrifugal casting. 4,405,398, Cl. 156-242.000.
Rothlisberger, Rudi; and Noser, Friedrich, to Wella Aktiengesellschaft. Treatment of dandruff with biguanides. 4,405,645, Cl. 424-326.000.
Rothman, Bengt: *See—*
Lovgren, Goran; and Rothman, Bengt, 4,405,553, Cl. 264-272.190.
Rotondo, Philip L.; and Rotondo, Thomas J. Method and apparatus for making reinforced concrete products. 4,404,786, Cl. 52-659.000.
Rotondo, Thomas J.: *See—*
Rotondo, Philip L.; and Rotondo, Thomas J., 4,404,786, Cl. 52-659.000.
Rott, Hans: *See—*
Nickel, Friedhelm; Koerner, Gotz; Schmidt, Gunter; and Rott, Hans, 4,405,328, Cl. 8-128.00A.
Rotter, Gerhard, to Luk Lamellen und Kupplungsbau GmbH. Method and device for operating a motor vehicle with an internal-combustion engine. 4,405,031, Cl. 180-165.000.
Rowlette, John J., to California Institute of Technology. Lead-acid battery. 4,405,697, Cl. 429-161.000.
Rubner, Roland: *See—*
Bierhenke, Hartwig; Birkle, Siegfried; and Rubner, Roland, 4,405,707, Cl. 430-281.000.
Ruckle, Duane L.: *See—*
Ulion, Nicholas E.; and Ruckle, Duane L., 4,405,660, Cl. 427-248.100.
Rudolph, Paul: *See—*
Kupfer, Hans; and Rudolph, Paul, 4,405,340, Cl. 48-86.00R.
Ruegsegger, Donald R. Fusible links. 4,405,914, Cl. 337-152.000.

Ruhl, John H.; and Dixon, Richard D., to Huck Manufacturing Company. Blind fasteners. 4,405,273, Cl. 411-43.000.

Ruhnau, Gerhard; Grubert, Klaus; Hesse, Karl-Heinz; and Auding, Rudolf, to WABCO Fahrzeugbremsen GmbH. Arrangement for monitoring the function of a programmable electronic switching circuit. 4,405,982, Cl. 364-200.000.

Ruoff, Arthur L.: *See*—
Balasubramanyam, Karanam; and Ruoff, Arthur L., 4,405,710, Cl. 430-311.000.

Ruti-Te Strake B.V.: *See*—
Manders, Petrus G. J., 4,404,996, Cl. 139-194.000.

Rutter, Jerry L.; Gibbs, Charles G.; and Hedrich, Loren W., to Gulf Oil Corporation. Arylthioureido pyridinecarbamino compounds and use as plant growth regulants. 4,405,791, Cl. 546-316.000.

Ruttershoff, Heinz-Joachim, to O & K Orenstein & Koppel Aktiengesellschaft. Hydraulic excavator with boom for large ranges of action and lifting heights. 4,405,281, Cl. 414-722.000.

Ryan, Leo F.: *See*—
Giannelli, Joseph F.; Flynn, George C.; and Ryan, Leo F., 4,405,466, Cl. 210-798.000.

Ryden, James W.: *See*—
Horsman, John; and Ryden, James W., 4,405,147, Cl. 280-443.000.

S&C Electric Company: *See*—
Dizon, Edmund S.; and Moninski, Joseph P., Jr., 4,405,844, Cl. 200-50.00A.

Saab-Scania Aktiebolag: *See*—
Bergman, Hans I.; and Nyman, Bjorn D., 4,405,145, Cl. 280-432.000.

SAB Industri AB: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,405,037, Cl. 188-196.00D.

Sabo, Joseph D.: *See*—
Hall, Eldon C.; Seward, Harold H.; Sabo, Joseph D.; De Marco, Vincent R.; and Prisant, Millard B., 4,405,985, Cl. 364-423.000.

Sadanandan, Kunissey P.; and Guntulis, Raymond S., to USM Corporation. Installer drive unit for chemical anchor. 4,404,875, Cl. 81-53.200.

Sadao, Yamanaka, to Nippon Thompson, Co., Ltd. Grinding machine with a method for securing dimensional accuracy. 4,404,774, Cl. 51-325.000.

Sage Products, Inc.: *See*—
Hanifl, Paul H., 4,404,881, Cl. 83-167.000.

Saidla, Glen W., to Whitney & Company, Inc. Resin transfer molding system with controlled induction period for expanded synthetic articles. 4,405,538, Cl. 264-45.500.

St. Georgiev, Vassil: *See*—
Brown, Richard E.; Loev, Bernard; and St. Georgiev, Vassil, 4,405,633, Cl. 424-272.000.

St. Joseph Bank and Trust Company, executor: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,519, Cl. 548-423.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,520, Cl. 548-423.000.
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Saint-Sevin, Michel; Blot, Michel; and Moirez, Jacques, to Societe d'Optique, Precision Electronique & Mecanique. Positioning control device. 4,405,204, Cl. 350-174.000.

Saitoh, Tatsuo; and Hasebe, Tsutomu, to Toho Asechiren Kabushikikaisha. Snap ring intended for prevention of looseness of a nut. 4,405,274, Cl. 411-249.000.

Sakai, Atsuo: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,405,955, Cl. 360-10.300.

Sakaida, Shinya: *See*—
Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.

Sakano, Takashi; and Igarashi, Mikio, to Niigata Engineering Co., Ltd. Rotary snow plough. 4,404,763, Cl. 37-250.000.

Sakiyama, Kazuo: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,405,679, Cl. 428-216.000.

Sakurai, Junji, to Fujitsu Limited. Method for manufacturing a field isolation structure for a semiconductor device. 4,404,735, Cl. 29-576.00W.

Sakurai, Kenjiro: *See*—
Mitsuhashi, Yoshinobu; Shimada, Junichi; Sakurai, Kenjiro; and Nakamura, Yukinobu, 4,405,236, Cl. 356-350.000.

Sakurai, Takehiro: *See*—
Kobayashi, Haruhiro; Funaki, Hidefumi; and Sakurai, Takehiro, 4,405,436, Cl. 204-298.000.

Salak, Scott W. Microphone mount for bass fiddle. 4,404,885, Cl. 84-329.000.

Salleras Escalante, Juan D., to Salleras Escalante, Juan D. Stapler with stapler storage space. 4,405,073, Cl. 227-120.000.

Salomon, Georges P. J., to Etablissements Francois Salomon & Fils. Safety binding for ski. 4,405,153, Cl. 280-629.000.

Samrowski, Dietrich: *See*—
Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

Samuels, Alvin, to Fox, Irwin; Samuels, Alvin; and Samuels, David. Scavenging natural gas streams with slurry apparatus. 4,405,563, Cl. 422-169.000.

Samuels, David: *See*—
Samuels, Alvin, 4,405,563, Cl. 422-169.000.

Sandberg, Glenn A.; and Lindee, Scott A., to Formax, Inc. Movable grid stacker for a food slicing machine. 4,405,186, Cl. 414-21.000.

Sanders Associates, Inc.: *See*—
Schwartz, Jacob, 4,405,010, Cl. 165-4.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,404,699, Cl. 8-149.100.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,405,491, Cl. 252-359.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method of continuously wet heat treating a cloth at an elevated temperature. 4,404,699, Cl. 8-149.100.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for forming foam. 4,405,491, Cl. 252-359.00E.

Sandoz Ltd.: *See*—
Cardinaux, Francois; Huguenin, Rene; and Pless, Janos, 4,405,607, Cl. 424-177.000.
Wald, Roland, 4,405,524, Cl. 260-372.000.

Sandstrom, Kenneth A.: *See*—
Hardison, Leslie C.; and Sandstrom, Kenneth A., 4,404,857, Cl. 73-827.000.

Sanilogical Corporation: *See*—
Kinzer, Jay; and Clingman, John W., 4,405,456, Cl. 210-195.400.

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Chao, Li-Chung; and Scharf, Daniel J., 4,405,732, Cl. 524-83.000.

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Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.

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Kling, Rudolf; and Scheider, Bernd, 4,405,859, Cl. 250-229.000.

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John, Peter; Artes, Reinhold; Frey, Volker; and Scherer, Matthias, 4,405,804, Cl. 556-476.000.

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Loshaek, Samuel; and Shen, Chah M., 4,405,773, Cl. 526-317.000.

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Zinn, Michael; Bauch, Tamil D.; and Schiff, Morton, 4,404,962, Cl. 126-450.000.

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Wunderlich, Klaus; Schlegel, Udo; and Ricke, Heinz, 4,405,248, Cl. 400-550.000.

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Nickel, Friedhelm; Koerner, Gotz; Schmidt, Gunter; and Rott, Hans, 4,405,328, Cl. 8-128.00A.

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Fitzpatrick, Joseph W.; and Schmidt, Harold N., 4,405,785, Cl. 546-30.000.

Schmuhl, Hans-Jurgen: *See*—
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Dage, Richard C.; Palopoli, Frank P.; Schnettler, Richard A.; and Grisar, J. Martin, 4,405,628, Cl. 424-263.000.

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Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,405,763, Cl. 525-438.000.

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Musch, Rudiger; Schubart, Rudiger; Gobel, Wilhelm; Alberts, Heinrich; and Hohmann, Gerhard, 4,405,742, Cl. 524-315.000.

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Flower, David I.; and Schuler, Michael, 4,405,044, Cl. 206-44.120.

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Schulz, Hartmut: *See*—
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Schumaker, Robert R.: *See*—
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Schur, Inc.: *See*—
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Oppenlaender, Knut; Schwartz, Erich; Barthold, Klaus; and Slotman, Wilhelmus, 4,405,494, Cl. 252-392.000.

Schwartz, Jacob, to Sanders Associates, Inc. Sensible heat storage unit. 4,405,010, Cl. 165-4.000.

Schwartz, William B., to Akzona Incorporated. Electrical socket with discreet impedance element attached thereto. 4,405,188, Cl. 339-17.0CF.

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Bulse, Ulf; and Schwarz, Henning, 4,405,834, Cl. 179-1.0GB.

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Koerdt, Reinhold; Schoening, Josef; and Schwiers, Hans-Georg, 4,405,055, Cl. 220-215.000.

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Potter, Keith E., 4,405,926, Cl. 343-123.000.

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Wood, Hugh C.; and Okkerse, Simon W. J. H., 4,404,860, Cl. 73-861.780.

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Seibert, Karl, to Akzona Incorporated. Consistency regulator for cosmetic and pharmaceutical preparations. 4,405,641, Cl. 424-305.000.

Seif, Rudolf: *See—*
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Seiko Kagaku Kogyo Co., Ltd.: *See—*
Yoshioka, Shigehiko; Yamada, Hideto; and Asakura, Akira, 4,405,408, Cl. 162-158.000.

Seilly, Alec H., to Lucas Industries Limited. Fuel system for internal combustion engines. 4,404,943, Cl. 123-458.000.

Seino, Michael J.: *See—*
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Soga, Mamoru; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,405,370, Cl. 106-20.000.

Selder, Harald, to Escher Wyss GmbH. Method for fractionating fiber stock obtained from waste paper and apparatus for the performance of the aforesaid method. 4,405,450, Cl. 209-3.000.

Semi, Hidetoshi: *See—*
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, 4,405,904, Cl. 331-87.000.

Sena, Ted: *See—*
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Septier, Louis; and Demange, Michel, to Societe Francaise d'Electrometallurgie Sofrem. Method and apparatus for rapidly solidifying and cooling melted products based on metal oxides by continuous casting. 4,405,545, Cl. 264-144.000.

Serafin, Frank G.; Previte, Robert W.; Greening, Nathan R.; Kantro, David L.; and Tang, Fulvio J., to W. R. Grace & Co. Gypsum-free cement compositions. 4,405,372, Cl. 106-90.000.

Serber, Stephen L., to Honeywell Inc. Burner ignition and flame monitoring system. 4,405,299, Cl. 431-78.000.

Serbin, David J.: *See—*
Gutierrez, Richard; Kay, Edward L.; and Serbin, David J., 4,405,532, Cl. 260-816.00R.

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Loeffler, Hans-Peter; Seufert, Walter; and Adolphi, Heinrich, 4,405,614, Cl. 424-215.000.

Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., to SAB Industri AB. Rail vehicle slack adjuster. 4,405,037, Cl. 188-196.00D.

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Hall, Eldon C.; Seward, Harold H.; Sabo, Joseph D.; De Marco, Vincent R.; and Prisant, Millard B., 4,405,985, Cl. 364-423.000.

Sgarz, Hugo: *See—*
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Shah, Pravinchandra K.: *See—*
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Shamir, Adi: *See—*
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Shapiro, Eugene: *See—*
Mravic, Brian; and Shapiro, Eugene, 4,405,386, Cl. 148-11.50A.

Sharp Kabushiki Kaisha: *See—*
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Hijikigawa, Masaya, 4,405,958, Cl. 360-113.000.
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Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, 4,405,219, Cl. 353-37.000.

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Sheinkop, Isac M., to Owens-Corning Fiberglas Corporation. Method for controlling a glass melting furnace. 4,405,351, Cl. 65-29.000.

Sheldon, Gary L., to Washington State University Research Foundation, Inc. Apparatus for transfer of metallic materials by electric discharge. 4,405,851, Cl. 219-76.130.

Shell Oil Company: *See—*
Brownscombe, Thomas F., 4,405,727, Cl. 523-205.000.
Gwyn, John E., 4,405,440, Cl. 208-48.00Q.
Hansen, David R., 4,405,680, Cl. 428-285.000.
Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,405,763, Cl. 525-438.000.
Raudenbusch, Werner T.; Barnhoorn, Adrianus J. M.; Kooijmans, Petrus G.; Sederel, Willem L.; Van Steenis, Adrianus M. C.; and Schets, Theresia F. M., 4,405,662, Cl. 427-386.000.
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Wong, Pui K.; Willis, Carl L.; and Brownscombe, Thomas F., 4,405,772, Cl. 526-308.000.

Shemyakin, Evgeny I.; and Kulakov, Gennady I. Deformograph. 4,405,231, Cl. 356-34.000.

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Sheppard, John E.: *See—*
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Sherman, William P.; Clark, Floyd R.; and Will, Lothar K., to Thomas Industries Inc. Fireplace heat extractor. 4,404,955, Cl. 126-121.000.

Sherritt Gordon Mines Limited: *See—*
Van der Meulen, Jack; and Weir, Donald R., 4,405,570, Cl. 423-43.000.
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,405,566, Cl. 423-15.000.

Shibata, Tatsuya: *See—*
Kuroda, Toshimasa; Ishii, Seiji; and Shibata, Tatsuya, 4,405,686, Cl. 428-374.000.

Shibata, Toshihiro: *See—*
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Nakahara, Yutaka, 4,405,736, Cl. 524-102.000.

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Shimada, Junichi: *See—*
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Shimai, Hideo, to Yoshida Kogyo, K.K. Apparatus for forming a space section in a pair of continuous slide fastener stringers. 4,404,722, Cl. 29-33.200.

Shimizu, Isamu; Ogawa, Kyosuke; and Inoue, Eiichi, to Canon Kabushiki Kaisha. Process for producing photoconductive member. 4,405,656, Cl. 427-39.000.

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Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,405,242, Cl. 368-82.000.

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Shin-Etsu Chemical Co., Ltd.: *See—*
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Shin, Masaaki: *See—*
Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.

Shindo, Akio: *See—*
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Shinoda, Yoshio; and Kuno, Akira, to Nippon Soken, Inc. Remote control switch apparatus for automobiles. 4,405,924, Cl. 340-825.720.

Shioda, Katashi: *See—*
Ando, Masao; Hirota, Tetsuya; and Shioda, Katashi, 4,405,455, Cl. 210-191.000.

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Shirai, Kazunari; and Tanaka, Izumi, to Fujitsu Limited. Semiconductor memory drive. 4,405,995, Cl. 365-174.000.

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Shirai, Yoshihiro, to Sharp Kabushiki Kaisha. Liquid crystal display devices with polyimide-siloxane copolymer resin alignment film. 4,405,208, Cl. 350-341.000.

Shiraishi, Masahiko: *See—*
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.

Shirato, Yoshiaki: *See—*
Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, 4,405,915, Cl. 338-15.000.

Shoji, Robert M.; Chudy, John S.; and Eberly, Carlyle J., to Discovision Associates. Tracking system for optical record medium. 4,406,000, Cl. 369-44.000.

Shook, David W., to Insulating Breaking Clamp, Inc. Breaking and insulating clamp for electrical conductors. 4,405,828, Cl. 174-138.00R.

Short, James N.: *See*—
Capshew, Charles E.; Short, James N.; Welch, M. Bruce; and Dietz, Richard E., 4,405,769, Cl. 526-119.000.

Showa Electric Wire & Cable Co., Ltd.: *See*—
Morita, Minoru; Hosokawa, Etsuo; and Arahara, Kohzoh, 4,405,687, Cl. 428-383.000.

Shrode, James W.: *See*—
Fritz, Thomas A.; and Shrode, James W., 4,404,871, Cl. 76-25.00A.

Shroot, Braham; Maignan, Jean; and Lang, Gerard, to Groupement d'Interet Economic dit: Centre International de Recherches Dermatologiques C.I.R.D. Composition for treatment of psoriasis containing 10-substituted 1,8-dihydroxy-9-anthrones. 4,405,615, Cl. 424-232.000.

Shuey, John R.: *See*—
Eaby, Daniel G.; and Shuey, John R., 4,405,192, Cl. 339-91.00R.

Shull, Steven W., to Vivitar Corporation. Pistol grip. 4,405,223, Cl. 354-293.000.

Shultz, William E. Method and apparatus for injecting viscous materials. 4,405,035, Cl. 184-1.00D.

Shyan Shen, John C.: *See*—
Blumentritt, Bruce F.; and Shyan Shen, John C., 4,405,684, Cl. 428-336.000.

Sickinger, Albert: *See*—
Albrecht, Gunter; Sickinger, Albert; and Schmuhl, Hans-Jurgen, 4,405,284, Cl. 415-174.000.

Siddens, Jack K.; and Raghu, Sivaraman, to American Cyanamid Company. Method for the preparation of difluoromethoxyaromatic compounds. 4,405,529, Cl. 260-465.00F.

Siebenhofer, Gottfried: *See*—
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,404,893, Cl. 91-405.000.

Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., to Stern Electronics, Inc. Coin-operated phonograph. 4,405,984, Cl. 364-410.000.

Sieja, Norman F., to Allied Corporation. Engine speed limiting circuit. 4,404,940, Cl. 123-335.000.

Siemens Aktiengesellschaft: *See*—
Baur, Guenter; Greubel, Waldemar; Krueger, Hans; and Schauer, Alois, 4,405,210, Cl. 350-345.000.
Bierhenke, Hartwig; Birkle, Siegfried; and Rubner, Roland, 4,405,707, Cl. 430-281.000.
Eckel, Max-Ferdinand, 4,405,508, Cl. 252-518.000.
Heimen, Jochen, 4,404,730, Cl. 29-569.00L.
Jaegle, Bruno, 4,405,848, Cl. 200-243.000.
Mueller, Gerhard; and Puritscher, Ernst, 4,404,867, Cl. 74-665.0GA.
Vorbach, Gunther; and Boehmer, Georg, 4,405,957, Cl. 360-99.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A: *See*—
Cavazza, Claudio; Carloni, Massimo; and Ramacci, Maria T., 4,405,638, Cl. 424-275.000.

Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Hydraulic mine prop. 4,404,893, Cl. 91-405.000.

Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Ester derivatives of N-arylsulfinyl-N-phosphonomethylglycinates as herbicides. 4,405,356, Cl. 71-87.000.

Simeth, Claus; Liebert, Oskar; and Theilacker, Klaus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Verso printing unit in the delivery of a sheet-fed rotary printing press. 4,404,905, Cl. 101-183.000.

Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for supplying ink to the printing plate of a printing press. 4,404,908, Cl. 101-349.000.

Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., to GTE Automatic Electric Labs Inc. Dual rail time control unit for a T-S-T-digital switching system. 4,406,005, Cl. 370-63.000.

Simon, Gerard; and Soldat, Andre, to Rhone-Poulenc Specialites Chimiques. Dismutation/redistribution of halogenosilanes into silane. 4,405,590, Cl. 423-347.000.

Simone, Andre A., to Lummus Company, The. Removal of quinoline insolubles from coal derived fractions. 4,405,439, Cl. 208-45.000.

Simpson, John F., Jr.: *See*—
Fenton, Edward A., Jr.; and Simpson, John F., Jr., 4,405,050, Cl. 209-668.000.

Simpson, Lewis H. Portable desk-work bench. 4,404,915, Cl. 108-43.000.

Simpson Strong-Tie Company, Inc.: *See*—
Gilb, Tyrell T., 4,404,781, Cl. 52-295.000.

Sindermann, Paul, to Diehl GmbH & Co. Chaff cartridge for aircraft defense. 4,404,912, Cl. 102-505.000.

Singer Company, The: *See*—
Dicke, William C., 4,405,004, Cl. 144-87.000.
Mecklenborg, Richard A., 4,405,941, Cl. 358-104.000.

Singer, Malcolm S., to Chevron Research Company. N-Alkyl or alkoxy-N'-substituted hydrocarbyl urea. 4,405,355, Cl. 71-86.000.

Singh, Vijay P., to Photon Power, Inc. Method of making a CdS/Cu_xS photovoltaic cell. 4,404,734, Cl. 29-572.000.

Sisbarro, Frederick P., to Carter-Wallace, Inc. Production of a post-foaming gel and system therefor. 4,405,489, Cl. 252-315.400.

Sisley, James R.; and Hickman, Robert O. Figure-eight, dual-lumen catheter and method of using. 4,405,313, Cl. 604-43.000.

Sisti, Giorgio; Trestianu, Sorin; and Riva, Ermete, to Carlo Erba Strumentazione S.p.A. Method and equipment for volumetrically controlled and reproducible introduction of small amounts of liquid samples into chromatographic analysis systems. 4,405,344, Cl. 55-67.000.

Sitt, Rudiger: *See*—
Kabbe, Hans-Joachim; Klauke, Erich; Krause, Hans P.; Mardin, Mithat; and Sitt, Rudiger, 4,405,644, Cl. 424-322.000.

Sjogreen, Carl-Axel E.: *See*—
Manson, Mans O.; Sjogreen, Carl-Axel E.; and Bergvall, Goran A., 4,405,471, Cl. 252-34.000.

Skaletz, Detlef H., to Hoechst Aktiengesellschaft. 4,4'-Diphenyl etherdialdehyde-bis-dimethylacetal. 4,405,816, Cl. 568-592.000.

Skimin, Carol W., to Harshaw Chemical Company, The. Blush-free acid zinc electroplating baths and process. 4,405,413, Cl. 204-55.00R.

Skis Rossignol S.A.: *See*—
Piegay, Yves, 4,405,149, Cl. 280-602.000.

Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See*—
Kopp, Ernst, 4,404,758, Cl. 36-121.000.

Skrycki, Robert R., to Ex-Cell-O Corporation. Engine gasket assembly. 4,405,138, Cl. 277-235.00B.

Slakmon, Gilbert. Apparatus for detecting faulty sectors and for allocating replacement sectors in a magnetic disc memory. 4,405,952, Cl. 360-49.000.

Slant Drilling Systems Ltd.: *See*—
Will, Brian C., 4,405,022, Cl. 175-85.000.

Slaugh, Lynn H.: *See*—
Tsang, Wen-Ghih; and Slaugh, Lynn H., 4,405,499, Cl. 252-432.000.

Sloan, Benjamin J., to Texas Instruments Incorporated. NPM Anti-saturation clamp for NPN logic gate transistor. 4,405,934, Cl. 357-15.000.

Slotman, Wilhelmus: *See*—
Oppenlaender, Knut; Schwartz, Erich; Barthold, Klaus; and Slotman, Wilhelmus, 4,405,494, Cl. 252-392.000.

Sly, Thomas L.: *See*—
Gerst, Carl W.; Paciorek, Leonard J.; and Sly, Thomas L., 4,405,895, Cl. 324-83.00D.

Smale, Terence C.: *See*—
Dickinson nee Berryman, Kay H.; Smale, Terence C.; and Southgate, Robert, 4,405,637, Cl. 424-274.000.

Smeeton, Roy: *See*—
Ragg, Pudens L.; Martin, Graham E.; and Smeeton, Roy, 4,405,407, Cl. 162-146.000.

Smigel, Irwin E. Toothpaste for natural teeth as well as composite filling material. 4,405,599, Cl. 424-53.000.

Smith, Arthur R.: *See*—
Johnson, Bertram; and Smith, Arthur R., 4,404,821, Cl. 66-139.000.

Smith, Harry: *See*—
Buckle, Derek R.; and Smith, Harry, 4,405,620, Cl. 424-250.000.

Smith, Henry M.: *See*—
Harrah, Larry A.; Mead, Keith E.; and Smith, Henry M., 4,405,487, Cl. 252-194.000.

Smith International, Inc.: *See*—
Best, Michael J. A., 4,405,016, Cl. 166-337.000.

Smith, Joel D.; and Johnson, Joseph M., to Cummins Engine Company, Inc. Stable fuel burner for preheating intake air of internal combustion engine. 4,404,931, Cl. 123-179.00H.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; and Ganellin, Charon R., 4,405,621, Cl. 424-250.000.
Roantree, Michael L.; and Young, Rodney C., 4,405,624, Cl. 424-256.000.

Smith, Peter B. Oily water separator. 4,405,459, Cl. 210-521.000.

Smith, Richard K. Portable recreational marker buoy. 4,405,303, Cl. 441-16.000.

Smith, William V., to Lectrolarm Custom Systems, Inc. Heat alarm indicator. 4,404,923, Cl. 116-214.000.

SmithKline Beckman Corporation: *See*—
Gaitanopoulos, Dimitri; and Weinstock, Joseph, 4,405,787, Cl. 546-112.000.

Smolanoff, Joel, to Rohm and Haas Company. Arthropod repellent compositions and methods. 4,405,630, Cl. 424-267.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Hild, Berthold; Braun, Martin; and Munker, Max, 4,404,831, Cl. 72-148.000.

Snellman, Donald L.: *See*—
Perrault, Eric P., 4,405,225, Cl. 355-14.00R.

Snyder, Clair W., Jr.: *See*—
Douty, George H.; Ritchie, Leon T.; and Snyder, Clair W., Jr., 4,405,189, Cl. 339-17.00C.

Snyder, Glenn M., to Litton Industrial Products, Inc. Cylindrical grinding machine. 4,404,772, Cl. 51-105.00R.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See*—
Curtil, Remi, 4,404,805, Cl. 60-606.000.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France: *See*—
Perrot, Jacques; and Thominet, Michel, 4,405,636, Cl. 424-274.000.

Societe d'Optique, Precision Electronique & Mecanique: *See*—
Saint-Sevin, Michel; Blot, Michel; and Moirez, Jacques, 4,405,204, Cl. 350-174.000.

Societe Francaise d'Electrometallurgie Sofrem: *See*—
Septier, Louis; and Demange, Michel, 4,405,545, Cl. 264-144.000.

Societe Franco-Belge des Laminoirs et Trefileries d'Anvers "Lamitref": *See*—
Cloostermans-Huwaert, Leo, 4,405,385, Cl. 148-11.50A.

Societe Internationale de Revetements de sol S.A. - S.I.R.S.: *See*—
Beaussier, Michel; Lesch, Henry; and Evon, Emile, 4,405,665, Cl. 428-17.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Surdi, Jean M., 4,405,285, Cl. 416-220.00R.
Societe Nationale Industrielle Aerospatiale: *See*—
Devienne, Jules H. P., 4,404,910, Cl. 102-200.000.
Societe Tecal: *See*—
Monvoisin, Jacques, 4,404,904, Cl. 101-126.000.
Soga, Mamoru; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, to Matsushita Electric Industrial Co., Ltd. Magnetic ink refining method. 4,405,370, Cl. 106-20.000.
Soldat, Andre: *See*—
Simon, Gerard; and Soldat, Andre, 4,405,590, Cl. 423-347.000.
Solomon, David E.: *See*—
Kool, Lawrence B.; Nolen, Robert L.; and Solomon, David E., 4,405,373, Cl. 106-198.000.
Solomon, Frank, to Diamond Shamrock Corporation. Strengthening of carbon black-teflon-containing electrode. 4,405,544, Cl. 264-127.000.
Sommermeyer, Uwe: *See*—
Schulte, Herbert; Brinkmann, Hans; and Sommermeyer, Uwe, 4,405,539, Cl. 264-77.000.
Sondermeyer, Jack C., to Peavey Electronics Corp. Circuit for distorting an audio signal. 4,405,832, Cl. 179-1.00D.
Soneda, Mitsuo, to Sony Corporation. Filter circuit having a charge transfer device. 4,405,908, Cl. 333-165.000.
Sonoda, Masakazu: *See*—
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,405,955, Cl. 360-10.300.
Sony Corporation: *See*—
Guisinger, Barrett E., 4,405,954, Cl. 360-65.000.
Haruta, Masao, 4,405,962, Cl. 360-96.600.
Kaimai, Hiroyuki; Sonoda, Masakazu; Komatsu, Masaaki; Sakai, Atsuo; and Kamai, Toshimitsu, 4,405,955, Cl. 360-10.300.
Ohsawa, Mitsuo, 4,405,971, Cl. 361-401.000.
Soneda, Mitsuo, 4,405,908, Cl. 333-165.000.
Sony Eveready Inc.: *See*—
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Sos, Jozsef: *See*—
Angyan, Sandor; Racz, Istvan; Radvanyi, Erzsebet; Kovats, Ferenc; Detre, Tamas; and Sos, Jozsef, 4,405,353, Cl. 11-3.000.
Sosinsky, Emanuel: *See*—
Aron, Mitchell; and Sosinsky, Emanuel, 4,405,939, Cl. 358-65.000.
Southgate, Robert: *See*—
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Soya, Masahiro: *See*—
Sugiyama, Shigeo; Soya, Masahiro; and Nagashima, Tugio, 4,405,001, Cl. 141-220.000.
Spadafora, Paul F., to Nabisco Brands, Inc. Compressed yeast product and process. 4,405,650, Cl. 426-62.000.
Spaderna, Dieter W.: *See*—
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,406,013, Cl. 377-29.000.
Spake, Ned B.: *See*—
Rodriguez, Larry A.; Padilla, Antonio A.; Ashworth, Robert A.; and Spake, Ned B., 4,405,332, Cl. 44-51.000.
Spalti, Alfred, to LGZ Landis & Gyr Zug AG. Measuring processes and apparatus for determining tariff values for energy consumers. 4,405,987, Cl. 364-483.000.
Spector, George: *See*—
Watson, Woodroe; and Spector, George, 4,405,003, Cl. 144-35.00R.
Speier, Klaus: *See*—
Disselbeck, Dieter; and Speier, Klaus, 4,405,460, Cl. 210-640.000.
Spelber, Leonard G., to Wastemate Corporation. Waste disposer coupling. 4,405,159, Cl. 285-38.000.
Spencer, Elbert M.: *See*—
Wolniak, Stanley C.; Spencer, Elbert M.; and Brown, Ronald L., 4,405,843, Cl. 200-44.000.
Spengler, Ernst M., to Stanztechnik GmbH R & S. Method and apparatus for manufacturing three-dimensional work pieces. 4,405,537, Cl. 264-45.400.
Sperry Corporation: *See*—
Casey, Martin J.; and Sheppard, John E., 4,405,406, Cl. 156-643.000.
Young, Peter L., 4,405,658, Cl. 427-63.000.
Spicer, Barry K., to Technicolor, Inc. Extended play cassette. 4,405,098, Cl. 242-200.000.
Spiros, Dennis J., to Nestier Corporation. Shelf support bracket. 4,405,052, Cl. 211-49.00D.
Sportoletti, Giancarlo; and Baglioni, Alessandro, to Italfarmaco S.p.A. Treatment of acute pulmonary edema with arginine esters. 4,405,643, Cl. 424-311.000.
Spratte, Hans-Hermann, to Krohne Messtechnik GmbH & Co. KG. Light gate with controlled optical couplers. 4,405,858, Cl. 250-221.000.
Squier, Joann H., to Mobil Oil Corporation. Film laminate food wrap and food pouch therefrom. 4,405,666, Cl. 428-35.000.
Staerzl, Richard E., to Brunswick Corporation. Regulator for a generator energized battery. 4,405,892, Cl. 322-89.000.
Stahl, Ted A. Thermoplastic labeling and method of making same. 4,405,401, Cl. 156-248.000.
Stainless Medical Products, Inc.: *See*—
Whetstine, Donald L., 4,405,142, Cl. 280-242.0WC.
Standard Oil Company, The: *See*—
Koch, Paul E.; Bond, Thomas J.; and Adams, Richard C., 4,405,547, Cl. 264-171.000.
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,405,777, Cl. 528-323.000.
Standard Oil Company (Indiana): *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,405,443, Cl. 208-113.000.
Fields, Ellis K., 4,405,523, Cl. 260-369.000.
Klotz, Marvin R., 4,405,502, Cl. 252-455.00R.
Klotz, Marvin R., 4,405,504, Cl. 423-458.000.
Stech, Eric N.; Montgomery, Mark S.; and Bates, J. Frederick, 4,405,809, Cl. 562-487.000.
Stanley, Robert A. Kitchen calculator. 4,405,991, Cl. 364-715.000.
Stanztechnik GmbH R & S: *See*—
Spengler, Ernst M., 4,405,537, Cl. 264-45.400.
Stapp, Paul R., to Phillips Petroleum Company. Uranium value leaching with ammonium carbonate and/or bicarbonate plus nitrate oxidant and optionally oxidation-catalytic metal compounds. 4,405,567, Cl. 423-17.000.
Stark, Heinz: *See*—
Konig, Heribert; and Stark, Heinz, 4,406,008, Cl. 373-102.000.
Stasiunas, Carl, to National Distillers and Chemical Corporation. Air-liquid valves for off-the-road vehicle tires. 4,404,985, Cl. 137-234.500.
Stauter, John C.: *See*—
Baldwin, Roger A.; Stauter, John C.; and Terrell, Donald L., 4,405,464, Cl. 210-717.000.
Stead, George E.; and Young, Lewis B., to Mobil Oil Corporation. Production of meta-isopropylphenolic products. 4,405,818, Cl. 568-781.000.
Stech, Eric N.; Montgomery, Mark S.; and Bates, J. Frederick, to Standard Oil Company (Indiana). Process for the manufacture of aromatic polycarboxylic acids having delta Y values below ten. 4,405,809, Cl. 562-487.000.
Stechmeyer, Frank W.: *See*—
Fenton, Donald M.; Delaney, Dennis D.; and Stechmeyer, Frank W., 4,405,825, Cl. 585-13.000.
Steel Heddle Manufacturing Co.: *See*—
Bowen, James B.; and Kramer, Charles F., 4,404,995, Cl. 139-92.000.
Root, Stephen J.; and Kramer, Charles F., 4,404,994, Cl. 139-91.000.
Steel, James S. Fireplace furnace. 4,404,954, Cl. 126-121.000.
Stefani, Giancarlo: *See*—
Neri, Amleto; Capitanio, Lorenzo; and Stefani, Giancarlo, 4,405,505, Cl. 252-461.000.
Stefanovic, Victor R.: *See*—
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Steffes, Helmut, to ITT Industries, Inc. Brake unit with a hydraulic boosting device. 4,404,803, Cl. 60-547.100.
Stein, Eric D., to Nestier Corporation. Security box having sliding closure. 4,405,057, Cl. 220-346.000.
Stein Industrie: *See*—
Perot, Francois; Pouderoux, Jacqueline; and Diez, Jacques, 4,404,928, Cl. 122-32.000.
Steinberger, Helmut: *See*—
Maas, Joachim; Steinberger, Helmut; and Moretto, Hans-Heinrich, 4,405,490, Cl. 252-358.000.
Steinke, Dale F.: *See*—
Jordan, James L.; Huntsinger, James E.; Steinke, Dale F.; and Williams, David W., 4,405,997, Cl. 366-111.000.
Stelt, David J.: *See*—
Simmons, Nathaniel; Magnusson, Stig; Puccini, Sergio E.; McLaughlin, Donald W.; and Stelt, David J., 4,406,005, Cl. 370-63.000.
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Stendel, Wilhelm: *See*—
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Stenz, Paul; and Wilmes, Manfred, to C. A. Weidmuller K.G. Method of making electrical contacts. 4,404,744, Cl. 29-883.000.
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., to University of Utah Research Foundation. Subcutaneous peritoneal injection catheter. 4,405,305, Cl. 604-49.000.
Sterling Drug, Inc.: *See*—
Barba, Robert L., 4,405,047, Cl. 206-570.000.
Margetts, George; Andrews, Roderic S.; and Legros, Jean, 4,405,800, Cl. 349-419.000.
Munzenmaier, Wolfgang; Eggensperger, Heinz; Ehlers, Helmut H.; Beilfuss, Wolfgang; Bucklers, Lothar; and Harke, Hans-Peter, 4,405,795, Cl. 349-417.000.
Stern Electronics, Inc.: *See*—
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,405,984, Cl. 364-410.000.
Stern, Gerhard: *See*—
Greinecker, Herbert; and Stern, Gerhard, 4,405,744, Cl. 524-423.000.
Stevens, David B., to Excalibur Automobile Corporation. Bobsled. 4,405,140, Cl. 280-16.000.
Stewart, Lawrence L., Jr., to Philip Morris Inc. Low delivery cigarette. 4,404,976, Cl. 131-339.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger utilizing induced diffusion and circulation. 4,404,755, Cl. 34-57.00A.
Stewart, Roger G., to RCA Corporation. Precharge with power conservation. 4,405,996, Cl. 365-203.000.

Stewart, Royann L.: *See—*
Bloss, Karl H.; and Stewart, Royann L., 4,405,352, Cl. 65-99.400.
Stockman, Richard F., to Air Preheater Company, Inc., The. Element basket. 4,405,011, Cl. 165-10.000.
Stockton, Thomas R., to Ford Motor Company. Variable displacement hydraulic pump and controls therefor. 4,405,288, Cl. 417-220.000.
Stockum, Bernt I. Connection between two elements. 4,405,253, Cl. 403-231.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, to Exxon Research and Engineering Co. Process for selective removal of H_2S from mixtures containing H_2S and CO_2 with tertiary amino azabicyclic alcohols. 4,405,580, Cl. 423-226.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, to Exxon Research and Engineering Co. Process for selective removal of H_2S from mixtures containing H_2S and CO_2 using diaminoether solutions. 4,405,582, Cl. 423-228.000.
Stogryn, Eugene L.; Savage, David W.; and Sartori, Guido, to Exxon Research and Engineering Co. Process for selective removal of H_2S from mixtures containing H_2S and CO_2 using di-severely sterically hindered secondary aminoethers. 4,405,583, Cl. 423-228.000.
Stogryn, Eugene L.; and Sartori, Guido, to Exxon Research and Engineering Co. Severely sterically hindered tertiary amino compounds. 4,405,811, Cl. 564-506.000.
Stogryn, Eugene L.: *See—*
Sartori, Guido; Savage, David W.; and Stogryn, Eugene L., 4,405,585, Cl. 423-228.000.
Savage, David W.; Sartori, Guido; and Stogryn, Eugene L., 4,405,581, Cl. 423-226.000.
Stoken, Donald R. Threading device. 4,405,267, Cl. 408-101.000.
Stone, Robert A.: *See—*
Carlson, Raymond G.; and Stone, Robert A., 4,405,101, Cl. 244-17.270.
Stoody, William R. Self-cleaning, isolated product, aerosol spray atomizing valve. 4,405,064, Cl. 222-148.000.
Storer, Richard E.: *See—*
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Strangman, Thomas E., to United Technologies Corporation. Method for producing columnar grain ceramic thermal barrier coatings. 4,405,659, Cl. 427-248.100.
Strauss, Paul: *See—*
Hockenbrock, Richard L.; and Strauss, Paul, 4,405,949, Cl. 358-237.000.
Stromberg, Gary D.: *See—*
Cochran, Gary L.; Dawson, James E.; and Stromberg, Gary D., 4,405,280, Cl. 414-685.000.
Stuck, Earl N.; Pigney, Keith D.; and Gifford, Howard, to Teledyne Industries, Inc. Metallic particle generation device. 4,405,296, Cl. 425-6.000.
Stuckey, Joan. Therapeutic exercise device. 4,405,129, Cl. 272-130.000.
Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Actively suspended counter-rotating machine. 4,405,286, Cl. 417-1.000.
Stuhlman, Frank A. Apparatus for collecting solar energy. 4,404,961, Cl. 126-432.000.
Stump, Theodore M.: *See—*
Hall, Jay D.; Stump, Theodore M.; and Thode, Charles W., 4,406,004, Cl. 370-15.000.
Stumpf, William S.: *See—*
Ball, Douglas C.; Stumpf, William S.; and Ludwig, Gary R., 4,404,776, Cl. 52-29.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG: *See—*
Hauser, Kurt, 4,405,039, Cl. 192-58.00B.
Suessenbeck, Heinrich: *See—*
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,404,893, Cl. 91-405.000.
Sugahara, Mituko, Yoshiyuki Sugahara, heirs: *See—*
Sugahara, Yujiro, deceased; Usui, Koichi; Ogawa, Masahide; Sato, Teiji; Mizoguchi, Yasuo; and Kojima, Seiji, 4,405,371, Cl. 106-21.000.
Sugahara, Yujiro, deceased (by Sugahara, Mituko, Yoshiyuki Sugahara, heirs); Usui, Koichi; Ogawa, Masahide; Sato, Teiji; Mizoguchi, Yasuo; and Kojima, Seiji, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Novel clay mineral color developer for pressure sensitive recording paper and process for producing same. 4,405,371, Cl. 106-21.000.
Sugano, Osamu, to Ricoh Company, Ltd. Thermal head device. 4,405,929, Cl. 346-76.0PH.
Sugawara, Kiyoshi: *See—*
Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, 4,405,123, Cl. 271-22.000.
Sugazaki, Kazuo: *See—*
Ozawa, Hiroshi; Shin, Masaaki; Fuziwara, Akio; Nakamura, Mitsuyoshi; Otsuka, Ichiro; and Sugazaki, Kazuo, 4,405,671, Cl. 428-65.000.
Sugibuchi, Kazuo: *See—*
Hirai, Bunji; Kubota, Naohiro; and Sugibuchi, Kazuo, 4,405,737, Cl. 524-102.000.
Kubota, Naohiro; Shibata, Toshihiro; Sugibuchi, Kazuo; and Nakahara, Yutaka, 4,405,736, Cl. 524-102.000.
Sugimori, Shigeru; Kojima, Tetsuhiko; and Tsuji, Masakazu, to Chisso Corporation. Liquid-crystalline halogenobenzene derivatives. 4,405,488, Cl. 252-299.630.
Sugimoto, Akiko: *See—*
Ishikawa, Masayuki; Sugimoto, Akiko; Eguchi, Yukuo; Sasaki, Fujinori; Ebisawa, Hisashi; Moriguchi, Soyao; and Gotoh, Katsuhiko, 4,405,623, Cl. 424-251.000.
Sugimoto, Mutsumi, to Katsuyama Kinzoku Kogyo Kabushiki Kaisha. Safety-belt buckle or slide-unlocking type. 4,404,715, Cl. 24-230.00A.
Sugimoto, Ryuji: *See—*
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.
Sugiyama, Katsuhiko: *See—*
Ohsawa, Katsuyuki; Sugiyama, Katsuhiko; and Idota, Yoshinori, 4,404,859, Cl. 73-861.180.
Sugiyama, Shigeo; Soya, Masahiro; and Nagashima, Tugio, to Tokico Ltd. Overflow preventing valve apparatus. 4,405,001, Cl. 141-220.000.
Sullivan, William C., to Rockwell International Corporation. Tool for installing an element on a shaft. 4,404,725, Cl. 29-252.000.
Sulpetro Minerals Limited: *See—*
Dienstbach, Ulrich, 4,405,569, Cl. 423-27.000.
Sulzer Brothers Limited: *See—*
Julich, Werner; and Muller, Gunter, 4,404,993, Cl. 139-66.00R.
Zweymuller, Karl, 4,404,693, Cl. 3-1.913.
Sumita, Norio: *See—*
Fujii, Tetsuya; Oguchi, Yukio; Sumita, Norio; and Goto, Isamu, 4,405,295, Cl. 419-28.000.
Sumitomo Chemical Company, Limited: *See—*
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,405,679, Cl. 428-216.000.
Nakata, Taiki; Kawazoe, Noriyuki; and Takenaka, Toshio, 4,405,750, Cl. 524-717.000.
Sun Tech. Inc.: *See—*
Hsu, Chao-Yang, 4,405,496, Cl. 252-429.00R.
Sunley, John T. Veterinarian salve. 4,405,604, Cl. 424-165.000.
Sunpower, Inc.: *See—*
Beale, William T., 4,404,802, Cl. 60-520.000.
Surdi, Jean M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Device to lock the blades of a turboblower and to fasten the front cowl of a turbojet engine. 4,405,285, Cl. 416-220.00R.
Sutcliffe, Gordon R.: *See—*
Hobbs, John F.; and Sutcliffe, Gordon R., 4,405,392, Cl. 149-109.600.
Suthers, Mark S., to Northern Telecom Limited. Surface acoustic wave (saw) devices having series-connected inter-digital transducers. 4,405,874, Cl. 310-313.00B.
Sutton, Leroy A.: *See—*
Woods, Jonathan L.; and Sutton, Leroy A., 4,405,964, Cl. 361-18.000.
Suturin, Serafim N.: *See—*
Belsky, Valentin I.; Suturin, Serafim N.; Orlov, Gennady I.; Dolgov, Anatoly V.; Goncharov, Boris K.; Antonov, Vladimir I.; and Naryshkin, Jury A., 4,405,118, Cl. 266-227.000.
Suzaki, Masayuki, to Ricoh Company, Ltd. Hammer device for printer. 4,405,246, Cl. 400-144.200.
Suzuki, Mikio: *See—*
Yamazaki, Masafumi; and Suzuki, Mikio, 4,404,944, Cl. 123-458.000.
Suzuki, Mitsuo: *See—*
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Kogi; and Suzuki, Mitsuo, 4,405,923, Cl. 340-825.560.
Suzuki, Yoshihiro: *See—*
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.
Svejkovsky, Ulrich: *See—*
Janz, Joachim; and Svejkovsky, Ulrich, 4,404,709, Cl. 16-111.00R.
Svenang, Jan T., to Tex Innovation AB. Packaging machine. 4,404,788, Cl. 53-512.000.
Swanson, Wayne A. Vapor/air control system. 4,404,947, Cl. 123-527.000.
Swavely, Donald F., to Polymer Corporation, The. Anti-static hose assemblies. 4,405,969, Cl. 361-215.000.
Sweeney, William M.: *See—*
Jenkins, Robert H., Jr.; and Sweeney, William M., 4,405,338, Cl. 44-78.000.
Sweeny, Henry D., to Swenco Limited. Heel filler and assembly for boots. 4,404,757, Cl. 36-107.000.
Swenco Limited: *See—*
Sweeny, Henry D., 4,404,757, Cl. 36-107.000.
Swenson, C. Henning: *See—*
Overstreet, Scott M.; and Swenson, C. Henning, 4,405,889, Cl. 320-1.000.
Overstreet, Scott M.; and Swenson, C. Henning, 4,405,975, Cl. 363-49.000.
Swindal, James L.; and Grantham, Daniel H., to United Technologies Corporation. Silicon-glass-silicon capacitive pressure transducer. 4,405,970, Cl. 361-283.000.
Sybertz, Ferdinand: *See—*
Sybertz, Hans; Sybertz, Ferdinand; and Schmidt, Arnold, 4,405,092, Cl. 241-294.000.
Sybertz, Hans; Sybertz, Ferdinand; and Schmidt, Arnold, to Hombak Maschinenfabrik GmbH U. Co. KG. Cutting device. 4,405,092, Cl. 241-294.000.

Sykes, Richard B.; and Wells, Jerry S., to E. R. Squibb & Sons, Inc. Process for preparing 1-carba-2-penem-3-carboxylic acid. 4,405,716, Cl. 435-119.000.

Syntex (U.S.A.) Inc.: *See*—
Kluge, Arthur F., 4,405,622, Cl. 424-250.000.

Tabb, David L.: *See*—
Rapkin, Myron C.; and Tabb, David L., 4,405,718, Cl. 436-8.000.

Tachibana, Keiichi: *See*—
Hoshino, Kazuo; Tanaka, Teruo; and Tachibana, Keiichi, 4,405,390, Cl. 148-37.000.

Tack, Carl E., to TransDyne, Inc. Rail fastener with gauge adjustment. 4,405,081, Cl. 238-282.000.

Tacke, Peter: *See*—
Freitag, Dieter; Reinking, Klaus; and Tacke, Peter, 4,405,554, Cl. 264-300.000.

Tada, Yasuo: *See*—
Fujimoto, Takanori; and Tada, Yasuo, 4,404,952, Cl. 123-602.000.

Tadokoro, Tomoo; Iwaki, Masato; and Okimoto, Haruo, to Toyo Kogyo Co., Ltd. Internal combustion engine having a turbo-supercharger and a catalytic exhaust gas purifying device. 4,404,804, Cl. 60-602.000.

Taguchi, Minoru: *See*—
Kanzaki, Koichi; and Taguchi, Minoru, 4,404,737, Cl. 29-577.00C.
Sasaki, Gen; Taguchi, Minoru; Kanzaki, Koichi; and Furukawa, Akihiko, 4,404,738, Cl. 29-577.00C.

Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal processing circuit. 4,405,901, Cl. 330-261.000.

Tahara, Iwao: *See*—
Aihara, Toshiharu; Tahara, Iwao; Matsuo, Yushin; Takahashi, Naoki; Wakabayashi, Takuo, deceased; and Wakabayashi, Shigemasa, executor, 4,405,241, Cl. 368-63.000.

Taiyo Yuden Co., Ltd.: *See*—
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,472, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,473, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,474, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,475, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,476, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, 4,405,477, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,478, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,479, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, 4,405,480, Cl. 252-62.3BT.

Tajiri, Koji; and Arimatu, Toshiharu, to Teijin Limited. Apparatus for manufacturing a bulky textured yarn. 4,404,718, Cl. 28-220.000.

Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for internal combustion engine. 4,404,798, Cl. 60-296.000.

Takagishi, Yasushi; Doi, Yoshio; Ohsuga, Kiichiro; Hoshi, Noboru; and Shionogi & Co., Ltd., to Shin-Etsu Chemical Co., Ltd. Medicament capsules for rectal application. 4,405,597, Cl. 424-35.000.

Takahashi, Eiji: *See*—
Horii, Juichi; Nakajima, Shuichi; and Takahashi, Eiji, 4,404,902, Cl. 101-122.000.

Takahashi, Hisashi: *See*—
Otoguro, Yasuo; Hashimoto, Katukuni; Takahashi, Hisashi; and Fujita, Toshio, 4,405,369, Cl. 75-126.00C.

Takahashi, Kozo, to Radio Research Laboratories Ministry of Posts & Telecommunications. Method for diversity reception and apparatus therefor. 4,406,017, Cl. 455-137.000.

Takahashi, Kusuhiko: *See*—
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, 4,405,419, Cl. 204-96.000.

Takahashi, Masaaki: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,405,824, Cl. 570-144.000.

Takahashi, Naoki: *See*—
Aihara, Toshiharu; Tahara, Iwao; Matsuo, Yushin; Takahashi, Naoki; Wakabayashi, Takuo, deceased; and Wakabayashi, Shigemasa, executor, 4,405,241, Cl. 368-63.000.

Takahashi, Nobuyuki: *See*—
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, 4,405,435, Cl. 204-298.000.

Takahashi, Yonosuke; Wada, Minoru; and Hasegawa, Eiichi, to Fuji Photo Film Co., Ltd. Optical information recording medium. 4,405,706, Cl. 430-271.000.

Takamatsu, Toshiaki: *See*—
Funada, Fumiaki; Takamatsu, Toshiaki; Yutaka, Ishii; and Wada, Tomio, 4,405,209, Cl. 350-341.000.

Takanashi, Kazuko: *See*—
Hasui, Hiroshi; Furihata, Toshikazu; Takanashi, Kazuko; and Ohmori, Masahiko, 4,405,807, Cl. 560-75.000.

Takano, Suwaji: *See*—
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,405,027, Cl. 180-56.000.

Takasaki, Yukio: *See*—
Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, 4,405,935, Cl. 357-31.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,405,617, Cl. 424-246.000.

Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. 3-(Propynyltetrazol)-thiomethyl-3-cephems. 4,405,617, Cl. 424-246.000.

Takayama, Takeshi: *See*—
Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, 4,405,704, Cl. 430-74.000.

Takeda Chemical Industries, Ltd.: *See*—
Fujita, Shoichi; Kodama, Katsuhisa; and Yuge, Kiyohiro, 4,405,682, Cl. 428-317.700.

Takehara, Hisao: *See*—
Misawa, Masatoshi; Takahashi, Kusuhiko; Okuda, Kinnosuke; Matsuura, Kiyoshi; Takehara, Hisao; and Ishikawa, Keiichiro, 4,405,419, Cl. 204-96.000.

Takemoto, Iwao: *See*—
Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, 4,405,935, Cl. 357-31.000.

Takemura, Reiji, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of sodium chlorate. 4,405,418, Cl. 204-95.000.

Takenaka, Toshio: *See*—
Nakata, Tiaki; Kawazoe, Noriyuki; and Takenaka, Toshio, 4,405,750, Cl. 524-717.000.

Takenoshita, Mitsuaki: *See*—
Nakamura, Ichiro; Takenoshita, Mitsuaki; Ichiryu, Ken; Akasaka, Yoshimichi; and Watanabe, Haruo, 4,404,892, Cl. 91-396.000.

Takeuchi, Higehumi: *See*—
Omori, Takashi; Koguchi, Kenji; Yamagishi, Masahiko; and Takeuchi, Higehumi, 4,405,951, Cl. 358-256.000.

Takeuchi, Yukihisa: *See*—
Takagi, Shigeru; Takeuchi, Yukihisa; Kamiya, Shigeru; Tomita, Masahiro; Oishi, Kiyohiko; and Kobashi, Kiyoshi, 4,404,798, Cl. 60-296.000.

Takeyama, Kokichi; Sugawara, Kiyoshi; and Fukagawa, Yasuyuki, to Fuji Xerox Co., Ltd. Automatic paper sheet feeding device for copying machine. 4,405,123, Cl. 271-22.000.

Takigawa, Akio: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,405,679, Cl. 428-216.000.

Talafuse, Larry J., to FMC Corporation. Safety valve manifold system. 4,405,014, Cl. 166-72.000.

Talbert, Lisa M. Exhibit of a decorative art work. 4,405,664, Cl. 428-14.000.

Tamahashi, Kunihiro: *See*—
Onuma, Shigeharu; Tamahashi, Kunihiro; Hosoya, Akira; Kakuta, Atsushi; Mori, Yasuki; and Morishita, Hirosada, 4,405,703, Cl. 430-69.000.

Tamura, Masaru: *See*—
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.
Hasegawa, Hiroshi; Negita, Moriyasu; Kamiya, Yoshiaki; Tamura, Masaru; Tamura, Masaru; and Kinoshita, Yuji, 4,405,911, Cl. 335-202.000.

Tamura, Takeo; Hara, Hiroshi; and Kido, Takayoshi, to Nissan Motor Company, Limited. Drive circuit for a wiper device. 4,405,887, Cl. 318-443.000.

Tanaka, Izumi: *See*—
Shirai, Kazunari; and Tanaka, Izumi, 4,405,995, Cl. 365-174.000.

Tanaka, Shinichi: *See*—
Etoh, Kuniomi; Nampei, Masaru; and Tanaka, Shinichi, 4,405,705, Cl. 430-270.000.

Tanaka, Teruaki, to Daido Tokushuko Kabushiki Kaisha. Rod shaped metal rolling apparatus and method. 4,404,834, Cl. 72-221.000.

Tanaka, Teruo: *See*—
Hoshino, Kazuo; Tanaka, Teruo; and Tachibana, Keiichi, 4,405,390, Cl. 148-37.000.

Tanaka, Toshikazu: *See*—
Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,848, Cl. 73-146.000.
Iwama, Atsuaki; Maikuma, Yoshimata; Okamoto, Masayoshi; Tanaka, Toshikazu; and Oikawa, Yuji, 4,404,849, Cl. 73-146.000.

Tanaka, Yasuo: *See*—
Ataka, Saburo; Imamura, Yoshinori; Tanaka, Yasuo; Matsubara, Hirokazu; and Maruyama, Eiichi, 4,405,879, Cl. 313-386.000.

Tang, Fulvio J.: *See*—
Serafin, Frank G.; Previte, Robert W.; Greening, Nathan R.; Kantro, David L.; and Tang, Fulvio J., 4,405,372, Cl. 106-90.000.

Tanita Corporation: *See*—
Yanagita, Shuichi; Miyoshi, Tsutomu; and Miyane, Masashi, 4,405,025, Cl. 177-210.0FP.

Taoka Chemical Company, Ltd.: *See*—
Nakata, Tiaki; Kawazoe, Noriyuki; and Takenaka, Toshio, 4,405,750, Cl. 524-717.000.

Tarrant Manufacturing Company: *See*—
Taylor, Bruce W., 4,405,089, Cl. 239-656.000.

Tate & Lyle Public Limited Company: *See*—
Lee, Cheang K., 4,405,654, Cl. 426-658.000.
Tate, Ralph, Jr.: *See*—
Paddock, Stephen W.; and Tate, Ralph, Jr., 4,404,813, Cl. 62-127.000.
Tatebe, Yoshikazu; Egami, Masafumi; and Miyawaki, Toshimitsu, to Mitsubishi Jukogyo Kabushiki Kaisha. Breather device for overhead valve engines. 4,404,936, Cl. 123-196.00R.
Tateishi, Hideki; Kamei, Tsuneaki; Abe, Katsuo; Kobayashi, Shigeru; Aiuchi, Susumu; Nakatsukasa, Masashi; Takahashi, Nobuyuki; and Sugimoto, Ryuji, to Hitachi, Ltd.; and Anelva Corporation. Apparatus for performing continuous treatment in vacuum. 4,405,435, Cl. 204-298.000.
Tatsumi, Tosiyuki: *See*—
Murase, Yasushi; Kanegae, Tosiyuki; Mitsuzawa, Hideaki; and Tatsumi, Tosiyuki, 4,404,771, Cl. 49-425.000.
Taylor, Alan N. Needle assembly and method for fabricating same. 4,405,307, Cl. 604-165.000.
Taylor, Alistair W.; Fikart, Josef; and Thompson, David, to AEL Microtel Ltd. Frequency deviation testing and adjusting system for frequency modulated oscillators. 4,405,897, Cl. 324-782.000.
Taylor, Bruce W., to Tarrant Manufacturing Company. Multiple conveyor. 4,405,089, Cl. 239-656.000.
Taylor, Henry F., to United States of America, Navy. Extended fiber optic sensor using birefringent fibers. 4,405,198, Cl. 350-96.290.
Taylor, Max F. Drawing table and easel conversion. 4,404,914, Cl. 108-9.000.
Taylor, Robert M., to United States of America, Navy. Variable wing position supersonic biplane. 4,405,102, Cl. 244-45.00R.
TBS International, Inc.: *See*—
Cave, Ellis K.; and Hazelwood, Neil, 4,405,833, Cl. 179-1.0MN.
Technar Incorporated: *See*—
Bell, Lon E., 4,404,949, Cl. 123-557.000.
Technicolor, Inc.: *See*—
Spicer, Barry K., 4,405,098, Cl. 242-200.000.
Technology Center: *See*—
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.
Tecumseh Products Company: *See*—
Kuczenski, Steven R., 4,404,933, Cl. 123-187.50R.
Teed, Richard K., to Riegel Textile Corporation. Process for manufacturing elastic leg disposable diapers. 4,405,397, Cl. 156-164.000.
Teige, Wolfgang: *See*—
Fuchs, Otto; Kroh, Adolf; and Teige, Wolfgang, 4,405,734, Cl. 524-90.000.
Teijin Limited: *See*—
Kuroda, Toshimasa; Ishii, Seiji; and Shibata, Tatsuya, 4,405,686, Cl. 428-374.000.
Tajiri, Koji; and Arimatu, Toshiharu, 4,404,718, Cl. 28-220.000.
Tekula, Endre: *See*—
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, 4,405,571, Cl. 423-53.000.
Teldix GmbH: *See*—
Hoffmann, Hartmut; and Baron, Klaus U., 4,405,200, Cl. 350-96.210.
Telease, Inc.: *See*—
Block, Robert S.; and Martin, John R., 4,405,942, Cl. 358-119.000.
Teledyne Industries, Inc.: *See*—
Stuck, Earl N.; Pigney, Keith D.; and Gifford, Howard, 4,405,296, Cl. 425-6.000.
Ternehall, Runo R. O., to Ab Volvo. Device for troque transmission between a drive shaft, e.g. an engine crankshaft, and an attachment unit such as a hydrodynamic retarder. 4,405,038, Cl. 192-4.00B.
Terrell, Donald L.: *See*—
Baldwin, Roger A.; Stauter, John C.; and Terrell, Donald L., 4,405,464, Cl. 210-717.000.
Terrell Machine Company, The: *See*—
Niederer, Kurt W., 4,404,719, Cl. 28-297.000.
Tetra Pak Developpement SA: *See*—
Petersen-Hoj, Peter, 4,405,400, Cl. 156-244.110.
Tew, Claude E.; and Ellis, Fred E., to Texas Instruments Incorporated. Heterodyne laser hanging system. 4,405,230, Cl. 356-5.000.
Tex Innovation AB: *See*—
Svenang, Jan T., 4,404,788, Cl. 53-512.000.
Texaco Inc.: *See*—
Elliott, Lloyd E., Jr.; and Hudson, John L., 4,405,033, Cl. 181-120.000.
Jenkins, Robert H., Jr.; and Sweeney, William M., 4,405,338, Cl. 44-78.000.
McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., 4,405,015, Cl. 166-267.000.
Texas Instruments Incorporated: *See*—
Sloan, Benjamin J., 4,405,934, Cl. 357-15.000.
Tew, Claude E.; and Ellis, Fred E., 4,405,230, Cl. 356-5.000.
Wall, Frederick G.; and Kwan, Stephen C., 4,405,918, Cl. 340-365.00C.
Textoris, Melvin A.: *See*—
McCracken, Richard W.; Textoris, Melvin A.; and Williams, Philip J., 4,404,785, Cl. 52-290.000.
Th. Goldschmidt AG: *See*—
Nickel, Friedhelm; Koerner, Gotz; Schmidt, Gunter; and Rott, Hans, 4,405,328, Cl. 8-128.00A.
Thalenfeld, David R., to Trion Industries, Inc. Merchandise hook. 4,405,051, Cl. 211-57.100.
Thaler, Warren A.: *See*—
Sartori, Guido; and Thaler, Warren A., 4,405,578, Cl. 423-223.000.
Sartori, Guido; and Thaler, Warren A., 4,405,579, Cl. 423-223.000.
Sartori, Guido; and Thaler, Warren A., 4,405,586, Cl. 423-233.000.
Thalmann, Claude, to Polytronic AG. Target member simulating an object to be fired on. 4,405,132, Cl. 273-348.100.
Theilacker, Klaus: *See*—
Simeth, Claus; Liebert, Oskar; and Theilacker, Klaus, 4,404,905, Cl. 101-183.000.
Thermal Associates, Inc.: *See*—
Kiley, Richard F.; and Larson, Ralph L., Jr., 4,404,739, Cl. 29-588.000.
Theurer, Josef, to Franz Plasser Bahnbauma-Schinen-Industriegesellschaft mbH. Tamping tool assembly. 4,404,913, Cl. 104-12.000.
Thiel, Charles G., to Riker Laboratories, Inc. Heparin web compositions. 4,405,612, Cl. 424-183.000.
Thim, Lars: *See*—
Moody, Alister J.; Thim, Lars; and Jorgensen, Karin D., 4,405,608, Cl. 424-177.000.
Thiokol Corporation: *See*—
Bell, Frank H.; and Peterson, John A., 4,404,911, Cl. 102-221.000.
Thode, Charles W.: *See*—
Hall, Jay D.; Stump, Theodore M.; and Thode, Charles W., 4,406,004, Cl. 370-15.000.
Thoma, Klaus D. Car window defroster. 4,404,705, Cl. 15-313.000.
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Sherman, William P.; Clark, Floyd R.; and Will, Lothar K., 4,404,955, Cl. 126-121.000.
Thomas, Jerry D.: *See*—
Griffith, Cecil B.; Thomas, Jerry D.; Demianczuk, Dionisyj W.; Abraham, John K.; and Franklin, Joseph E., 4,405,380, Cl. 148-2.000.
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Thomas, Stephen E. Method and apparatus for generating electrical energy from the rotation of a wheel. 4,405,872, Cl. 310-75.00R.
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Perrot, Jacques; and Thominet, Michel, 4,405,636, Cl. 424-274.000.
Thompson, David: *See*—
Taylor, Alistair W.; Fikart, Josef; and Thompson, David, 4,405,897, Cl. 324-782.000.
Thompson, David J.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,405,211, Cl. 350-349.000.
Thomson-Brandt: *See*—
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,862, Cl. 250-318.000.
Thomson-CSF: *See*—
Cornet, Jean; Lehureau, Jean-Claude; and Magna, Henriette, 4,405,994, Cl. 365-126.000.
Resneau, Jean C.; Doyen, Jean; and Ribier, Robert, 4,404,745, Cl. 29-841.000.
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Thornton, Arthur W.: *See*—
Nyquist, John D.; Kwasniewski, Gary K.; Thornton, Arthur W.; Vest, Paul E.; and Ducklo, Kenneth E., 4,405,492, Cl. 252-370.000.
Thorogood, Peter B., to Burroughs Wellcome Co. Imidazole derivatives for treating myocardial infarction. 4,405,634, Cl. 424-273.00R.
Thulman, Robert D.; and Erickson, Alve J. Stove for burning combustible solid fuels. 4,404,953, Cl. 126-77.000.
Thumm, Helmut: *See*—
Bahr, Theodor; Heinrich, Hans-Otto; and Thumm, Helmut, 4,405,091, Cl. 241-33.000.
Tick, Paul A., to Corning Glass Works. Mercury thallium fluorophosphate glasses. 4,405,724, Cl. 501-44.000.
Tick, Paul A.: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Tick, Paul A.; and Trotter, Donald M., 4,405,672, Cl. 428-68.000.
Tillotson, John G. Method for forming a layer of blown cellular urethane on a carpet backing. 4,405,393, Cl. 156-78.000.
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Johnson, Irvin D.; Timlin, Gary M.; and Yuill, Robert D., 4,404,843, Cl. 73-49.200.
Titus, John S., to Possis Medical, Inc. Method and apparatus for monitoring and displaying heart rate and blood pressure product information. 4,404,974, Cl. 128-670.000.
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Nitschko, Theodor, 4,405,152, Cl. 280-625.000.
Tobey, James F., Jr.: *See*—
Jeffreys, George A.; Tobey, James F., Jr.; and Price, Jean L., 4,405,649, Cl. 426-59.000.
Tobias, Michael A.; and Lynch, Conrad L., to Mobil Oil Corporation. Thermosettable polyester resin compositions containing caprolactone. 4,405,764, Cl. 525-443.000.
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Tokarz, Richard D. Coolant monitoring apparatus for nuclear reactors. 4,405,559, Cl. 376-247.000.

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Tokunaga, Takeshi: *See*—
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Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
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Koshino, Yutaka; Ajima, Takashi; Ohshima, Jiro; and Abe, Masahiro, 4,404,736, Cl. 29-576.00W.
Nitta, Tsuneo; and Kasuya, Hideki, 4,405,838, Cl. 179-1.0SD.
Ohba, Hiroshi; and Horino, Shigeo, 4,404,723, Cl. 29-33.520.
Oida, Yoshio; Sasaki, Masayuki; and Semi, Hidetoshi, 4,405,904, Cl. 331-87.000.
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Sato, Kenzi, 4,405,945, Cl. 358-154.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,405,901, Cl. 330-261.000.

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Tomita, Masahiro: *See*—
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Toms River Chemical Corporation: *See*—
Fitzpatrick, Joseph W.; and Schmidt, Harold N., 4,405,785, Cl. 546-30.000.

Tooley, Jack R., to Acrow Limited. Scaffolding. 4,405,254, Cl. 403-246.000.

Totem, Inc.: *See*—
Mclaughlin, Thomas M.; McLeod, William D.; Madsen, Nels H.; and Peyton, Ronald G., 4,405,128, Cl. 272-117.000.

Toth, Kalman A. Magnetic toy. 4,404,766, Cl. 46-239.000.

Toyo Boseki Kabushiki Kaisha t/a Toyoba Co., Ltd.: *See*—
Etoh, Kuniomi; Nampei, Masaru; and Tanaka, Shinichi, 4,405,705, Cl. 430-270.000.

Toyo Kogyo Co., Ltd.: *See*—
Tadokoro, Tomoo; Iwaki, Masato; and Okimoto, Haruo, 4,404,804, Cl. 60-602.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
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Toyota Jidosha K.K.: *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Numazawa, Akio; and Arai, Hajime, 4,404,869, Cl. 74-740.000.
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.
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Tyuuman, Tutomu, 4,405,160, Cl. 285-39.000.

Trager, John E., to Procon International Inc. Process for vapor-liquid contacting and fractional distillation. 4,405,449, Cl. 208-350.000.

Trammell, Joel H., to Chicago Bridge & Iron Company. Pressure seated closure for containment drain. 4,404,988, Cl. 137-565.000.

TransDyne, Inc.: *See*—
Tack, Carl E., 4,405,081, Cl. 238-282.000.

Travaglini, Michael A.: *See*—
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Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,404,919, Cl. 112-121.110.

Trementozzi, Quiriano A.: *See*—
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Tri-Dynamics Dental Co., Inc.: *See*—
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Trion Industries, Inc.: *See*—
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Trommen, Hartmut: *See*—
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Trotter, Donald M.: *See*—
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Truax, Bruce E.: *See*—
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Trudtzschler GmbH & Co. KG: *See*—
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Trunov, Mikhail B.: *See*—
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.

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Tsai, Tepin; and Tsai, Teh-Chung. Method of constructing underpass across railway and highway without affecting normal traffic thereof. 4,405,260, Cl. 405-184.000.

Tsang, Wen-Ghih; and Slaugh, Lynn H., to Shell Oil Company. Zeolite-ruthenium-borane catalyst composition. 4,405,499, Cl. 252-432.000.

Tschida, Eraine J., Sr. Tube dispensing device. 4,405,062, Cl. 222-102.000.

Tschudy, Donald B.; and Lorson, Emmett D., to Hoover Company, The. Cleaner with dirt cup. 4,405,346, Cl. 55-357.000.

Tsien, Grace: *See*—
Giacobbe, Thomas J.; and Tsien, Grace, 4,405,805, Cl. 560-21.000.

Tsubokura, Takeki: *See*—
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Tsuchiya, Toshio: *See*—
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Tsukada, Toshihisa: *See*—
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Tsukada, Tsutomu; and Ukai, Katsumi, to Anelva Corporation. Spectral monitoring device for both plasma etching and sputtering. 4,405,989, Cl. 364-525.000.

Tucker, George W. Method and apparatus for salvaging large pipe elbows. 4,405,384, Cl. 148-9.600.

Tufts, Wesley M.: *See*—
Heinze, Walter O.; Tufts, Wesley M.; and White, Jeffrey F., 4,404,696, Cl. 4-420.000.

Tuin, Hermanus N., to U.S. Philips Corporation. Method and arrangement for internally coating a tube by reactive deposition from a gas mixture activated by a plasma. 4,405,655, Cl. 427-38.000.

Tults, Juri; and French, Michael P., to RCA Corporation. Dual search mode type tuning system. 4,405,947, Cl. 358-193.100.

Turbak, Albin F.; and Hartmann, Peter J., to International Telephone and Telegraph Corporation. Zinc-free preparation of rayon fibers. 4,405,549, Cl. 264-188.000.

Turiot, Andre: *See*—
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Turner, Clara: *See*—
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Charman, David H.; Turner, Clara; and Turner, Henry W., 4,405,104, Cl. 244-122.0AF.

Turnquist, Edwin W.; and Bentley, Rick J., to Paccar Inc. Brake valve for a hydraulically powered winch. 4,404,891, Cl. 91-45.000.

Tusel, Gunter; and Ballweg, Achim. Method and apparatus for dehydrating mixtures of organic liquids and water. 4,405,409, Cl. 202-200.000.

Tuttle, Richard R.: *See*—
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Tyler Refrigeration Corporation: *See*—
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U-Haul Technical Center: *See*—
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UBE Industries, Ltd.: *See*—
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Uchidoi, Masanori: *See*—
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Udipi, Kishore: *See*—
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Herbort, Hans-Joachim; and Schuster, Heinz G., 4,405,565, Cl. 422-197.000.

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Ukita, Michito: *See—*
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Ulion, Nicholas E.; and Ruckle, Duane L., to United Technologies Corporation. Method for producing metallic articles having durable ceramic thermal barrier coatings. 4,405,660, Cl. 427-248.100.
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Union Carbide Corporation: *See—*
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Lee, Kiu H.; and Cieloszyk, Gary S., 4,405,495, Cl. 252-429.00B.
Van den Sype, Jaak S., 4,404,827, Cl. 72-41.000.
Union Oil Company of California: *See—*
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Jost, John W.; Lieffers, William C.; and Whitescarver, Olin D., 4,405,463, Cl. 210-712.000.
Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
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Agriculture: *See—*
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Health and Human Services: *See—*
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Merril, Carl R., 4,405,720, Cl. 436-86.000.
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Studer, Philip A., 4,405,286, Cl. 417-1.000.
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Taylor, Robert M., 4,405,102, Cl. 244-45.00R.
U.S. Philips Corporation: *See—*
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Jansen, Winfried; and Nolde, Wolfgang, 4,405,835, Cl. 179-1.0GS.
Peters, Joseph H., 4,405,936, Cl. 358-13.000.
Tuin, Hermanus N., 4,405,655, Cl. 427-38.000.
van de Plass..he, Rudy J., 4,405,900, Cl. 330-151.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,405,902, Cl. 330-271.000.
van Lierop, Dirk F. W., 4,405,194, Cl. 339-147.00P.
van Pelt, Pieter; and Wijdenes, Jacob, 4,405,708, Cl. 430-281.000.
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United Technologies Corp.: *See—*
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Mansell, Dennis N., 4,405,232, Cl. 356-121.000.
Rannenberg, George C., 4,405,290, Cl. 417-282.000.
Strangman, Thomas E., 4,405,659, Cl. 427-248.100.
Swindal, James L.; and Grantham, Daniel H., 4,405,970, Cl. 361-283.000.
Ulion, Nicholas E.; and Ruckle, Duane L., 4,405,660, Cl. 427-248.100.
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Thomas, Richard C., 4,405,797, Cl. 549-361.000.
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Urbas, Branko, to CPC International Inc. Recovery of acetic acid from a fermentation broth. 4,405,717, Cl. 435-140.000.
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Ushimaru, Chuji, to Decol Co., Ltd. Metal strip for preventing invasion. 4,404,778, Cl. 52-101.000.
Ushiro, Masayuki; and Tsubokura, Takeki, to Nissan Motor Co., Ltd. Waste binding yarn take-up device for shuttleless loom. 4,404,997, Cl. 139-291.00R.
USM Corporation: *See—*
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USV Pharmaceutical Corporation: *See—*
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Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, 4,405,915, Cl. 338-15.000.
Vadasdi, Karoly; Bartha, Laszlo; Millner, Tivadar; Tekula, Endre; and Kiss, Andras, to MTA Muszaki Fizikai Kutato Intezete. Process for selective dissolution of molybdenum in the presence of tungsten. 4,405,571, Cl. 423-53.000.
Valenti, James P., to Armstrong World Industries, Inc. Scupper device. 4,404,981, Cl. 137-67.000.
Valle, Roger: *See—*
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Valley Rolling Mills, Inc.: *See—*
Gorman, Kenneth G.; and Marx, Richard A., 4,404,784, Cl. 52-534.000.
Valmet Oy: *See—*
Koskivirta, Veikko; and Haantera, Antti, 4,405,259, Cl. 405-62.000.
Valyi, Emery I. Process and apparatus for forming oriented, blown articles. 4,405,556, Cl. 264-513.000.
Van den Sype, Jaak S., to Union Carbide Corporation. Method and apparatus for drawing wire. 4,404,827, Cl. 72-41.000.
van de Plassche, Rudy J., to U.S. Philips Corporation. Operational amplifier. 4,405,900, Cl. 330-151.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Push-pull output stage. 4,405,902, Cl. 330-271.000.
Van der Meulen, Jack; and Weir, Donald R., to Sherritt Gordon Mines Limited. Removal of dissolved cadmium and copper from sulphate solution with hydrogen sulfide. 4,405,570, Cl. 423-43.000.
Vande Woude, George F.; McClements, William L.; Oskarsson, Marianne K.; and Blair, Donald G., to United States of America, Health and Human Services. LTR-Vectors. 4,405,712, Cl. 435-5.000.
Van Dongen, Robert H.; and Newsome, John R., to Shell Oil Company. Process for the preparation of hydrocarbon oil distillates. 4,405,441, Cl. 208-61.000.
van Lierop, Dirk F. W., to U.S. Philips Corporation. Electrical plug. 4,405,194, Cl. 339-147.00P.
van Oorschot, Gosewinus F., to Atlas Copco Aktiebolag. Device for separating liquid from liquid-containing compressed gas. 4,405,345, Cl. 55-184.000.
van Pelt, Pieter; and Wijdenes, Jacob, to U.S. Philips Corporation. Method of applying a resist pattern on a substrate, and resist material mixture. 4,405,708, Cl. 430-281.000.
Van Steenis, Adrianus M. C.: *See—*
Raudenbusch, Werner T.; Barnhoorn, Adrianus J. M.; Kooijmans, Petrus G.; Sederel, Willem L.; Van Steenis, Adrianus M. C.; and Schets, Theresia F. M., 4,405,662, Cl. 427-386.000.
Van Zeeland, Anthony J., to Oak Industries Inc. Movable member membrane switch. 4,405,841, Cl. 200-11.00R.

Varco International, Inc.: *See—*
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Varta Batterie Aktiengesellschaft: *See—*
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Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Company, The. Cosmetics brush. 4,404,977, Cl. 132-88.700.
Vaughan, Ronald J., to Chevron Research Company. Catalyzed electrochemical gasification of carbonaceous materials at anode and electrowinning of metals at cathode. 4,405,420, Cl. 204-105.00M.
VDO Adolf Schindling AG: *See—*
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VEB Chemiewerk Nunchritz: *See—*
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Vereinigte Flugtechnische Werke GmbH: *See—*
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Kohno, Tsutomu, 4,405,095, Cl. 242-179.000.
Villa-Real, Antony-Euclid C. Automatic two-component medication time-interval reminder cap and container. 4,405,045, Cl. 206-534.000.
Vivier, Ghislain; and Gauthier, Aurele. Ampoule breaker. 4,405,069, Cl. 225-93.000.
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Krennbauer, Franz, 4,405,374, Cl. 106-100.000.
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W & A Bates Limited: *See—*
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Wade, Wallace R., to Ford Motor Company. Removal of particulates from diesel engine exhaust gas. 4,404,796, Cl. 60-274.000.
Wagner, Hans, to G. D. Searle & Co. 8-Substituted 7-phenyl-1,2,4,-triazolo[4,3-c]/[2,3-c]pyrimidines-5-amines and amides. 4,405,780, Cl. 544-263.000.
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D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,520, Cl. 548-423.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,521, Cl. 548-423.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,405,786, Cl. 546-66.000.
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Wakabayashi, Shigemasa, executor: *See—*
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Wakeem, Dale. Method and apparatus for reducing tires. 4,405,090, Cl. 241-3.000.
Wald, Roland, to Sandoz Ltd. Anthraquinone dyes and method of use. 4,405,524, Cl. 260-372.000.
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Wallace, Robert S. Attachment of frame sections. 4,405,255, Cl. 403-402.000.
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Walter, Richard P.; and Muller, Robert D., to Bendix Corporation, The. Low leakage fuel injector. 4,405,082, Cl. 239-91.000.
Walter, Thomas J., to Ethyl Corporation. Substituted pyridines and their preparation. 4,405,792, Cl. 546-346.000.
Wang Laboratories, Inc.: *See—*
Pick, George G.; and Rasekhi, Houshang, 4,405,960, Cl. 360-125.000.
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Badger, Stephen L., 4,405,336, Cl. 44-56.000.
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Watanabe, Haruo: *See—*
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Watanabe, Hideo, to Yokohama Rubber Co., Ltd., The. Ultraviolet-curing composition, prepreg sheet containing the same, and metallic material having anticorrosive coating. 4,405,689, Cl. 428-467.000.
Watanabe, Michitoshi, to Tomoe Special Machine Co., Ltd. Tag feed mechanism. 4,405,124, Cl. 271-135.000.
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Watarai, Shu; Ishii, Kazuo; and Takayama, Takeshi, to Fuji Photo Film Co., Ltd.,. Triphenylmethane polymer, process for production thereof, and photoconductive compositions and members formed therefrom. 4,405,704, Cl. 430-74.000.
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Weber, Harold J. Shaft position synchronization means for multiple synchronous induction motors. 4,405,884, Cl. 318-85.000.

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Wegener, Gerhard; Knofel, Hartmut; Ellendt, Gunther; and Petinaux, Marcel, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates. 4,405,527, Cl. 260-453.0PH.

Weidler, Charles H., to AMP Incorporated. Preloaded electrical connector. 4,405,193, Cl. 339-99.00R.

Weinecke, Michael H.: *See*—
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Weiss, David L.; Ziolko, Eric F.; and Williams, Tim A., to Motorola, Inc. Receiver for CVSD modulation with integral filtering. 4,406,010, Cl. 375-32.000.

Weiss, Joseph. Toasters. 4,404,899, Cl. 99-332.000.

Weisstein, Naomi. Enhancing the perceptibility of barely perceptible images. 4,405,920, Cl. 340-700.000.

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Weldon, William F.; and Woodson, Herbert H., to Board of Regents, University of Texas System. Current limiting device for overcurrent protection. 4,405,965, Cl. 361-43.000.

Wella Aktiengesellschaft: *See*—
Rothlisberger, Rudi; and Noser, Friedrich, 4,405,645, Cl. 424-326.000.

Wells, Charles H., to Envirotech Corporation. Process for cleaning undeslimed coal. 4,405,453, Cl. 209-172.500.

Wells, James E., to Air Products and Chemicals, Inc. Method of making triethylenediamine. 4,405,784, Cl. 544-352.000.

Wells, Jerry S.: *See*—
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Welschof, Hans-Heinrich; and Beier, Rudolf, to Lohr & Bromkamp GmbH. Wheel hub assembly. 4,405,032, Cl. 180-259.000.

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Wentzell, J. Michael, to United Technologies Corporation. Method for separating particulate materials. 4,405,452, Cl. 209-172.000.

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Wermelinger, Hans, to Contraves AG. Stepping mechanism for an encoding rotary switch. 4,405,842, Cl. 200-17.00R.

Werner, Kenneth R.; and Huff, James F., to Marathon Oil Company. Seafloor velocity and amplitude measurement apparatus method. 4,405,036, Cl. 181-110.000.

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Wessel, Terry: *See*—
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West Company, The: *See*—
Case, Kirt L., 4,405,317, Cl. 604-90.000.

Westby, Roger L. Rock trap for a combine. 4,404,975, Cl. 130-27.0JT.

Western Electric Co.: *See*—
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Westinghouse Electric Corp.: *See*—
Brooker, Lenon G.; and Mungin, Halbert, 4,405,690, Cl. 428-503.000.
Holtzman, Barry L., 4,405,963, Cl. 361-16.000.
Mangus, James D.; and Cooper, Martin H., 4,405,558, Cl. 376-233.000.
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Whitney & Company, Inc.: *See*—
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Whitney, Douglas S. G.; and Martin, John K., III. Injector with ratchet drive and reproducing system. 4,405,318, Cl. 604-155.000.

Wiart, Albert C., to Jeumont Schneider Corporation. Adapter for intermediary circuit of a static converter assembly. 4,405,888, Cl. 318-803.000.

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Hafner, Walter; Markl, Erich; Eibel, Ludwig; Kreis, Gerhard; Samrowski, Dietrich; Wick, Manfred; Deubzer, Bernward; and Friedrich, Wilhelm, 4,405,469, Cl. 252-28.000.

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Wiethoff, Gunter, to Cuno Melcher KG ME-Sportwaffen, Firma. Folding knife. 4,404,748, Cl. 30-161.000.

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Wildt Mellor Bromley Limited: *See*—
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Wiley, Richard H. 6-(Carbo-t-butoxy)-3-mercapto-4-acetamino-1,2,4-triazin-5-ones. 4,405,779, Cl. 544-182.000.

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Will, Brian C., to Slant Drilling Systems Ltd. Tubular handling system for oil drilling rigs. 4,405,022, Cl. 175-85.000.

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Williams, David J.; Meredith, Gerald R.; and Olin, George R., to Xerox Corporation. Composite quasi-crystalline material. 4,405,733, Cl. 524-87.000.

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Williams, James M., Jr.: *See*—
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Williams, Virgil R.; and Williams, James M., Jr. Suspended modular floor assembly. 4,404,782, Cl. 52-475.000.

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Wills, Angela B.: *See*—
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Wills, David V.; and Wills, Angela B., to Priester, Handy C., a part interest. Message medium having corresponding optical and tactile messages. 4,404,764, Cl. 40-124.100.

Wilmes, Manfred: *See*—
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Wilson, Donald R.: *See*—
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Windmoller & Holscher: *See*—
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Wine, Charles M., to RCA Corporation. Servo system for a videodisc player carriage assembly. 4,406,002, Cl. 369-220.000.

Winter, Albert J., to Modern Inventions (Proprietary) Limited. Handle. 4,404,708, Cl. 16-110.00R.

Winterholler, Johann: *See*—
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Kooymans, Petrus G.; Wintraecken, Johannes J. M. H.; Raudenbusch, Werner T.; Seelen-Kruijssen, Josepha M. E.; and Schreurs, Gerardus C. M., 4,405,763, Cl. 525-438.000.

Wirth, John L. Shutterless optical system for viewing motion pictures. 4,405,218, Cl. 352-108.000.

Withers, David L. Bi-string dental floss holder. 4,404,978, Cl. 132-91.000.

Witt, Donald R., to Phillips Petroleum Company. Aging of chromium-containing gel at high pH. 4,405,501, Cl. 252-452.000.

Wittren, Richard A., to Deere & Company. Steering system and compensating valve. 4,405,030, Cl. 180-153.000.

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Wolf, Horst; and Guttler, Hermann, to Zinser Textilmaschinen GmbH. Spinning machine. 4,404,791, Cl. 57-80.000.

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Wollar, Burnell J., to Phillips Plastics Corporation. Two-piece fastener with front shoulder. 4,405,272, Cl. 411-41.000.

Wolniak, Stanley C.; Spencer, Elbert M.; and Brown, Ronald L., to Eastern Company, The. Anti-static switch lock. 4,405,843, Cl. 200-44.000.

Wong, Pui K.; Willis, Carl L.; and Brownscombe, Thomas F., to Shell Oil Company. Butene-1-vinylcyclohexene copolymer. 4,405,772, Cl. 526-308.000.

Wood, Dennis E., to Rando Machine Corporation. Apparatus for feeding fibers to carding machines and the like. 4,404,710, Cl. 19-105.000.

Wood, Hugh C.; and Okkerse, Simon W. J. H., to SED Systems Inc. Flow rate sensor. 4,404,860, Cl. 73-861.780.

Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., to Collins & Aikman Corporation. Paint roller. 4,404,703, Cl. 15-230.110.

Woodall, Leigh C., Jr.; Hayes, John T.; and Currier, Robert G., to Collins & Aikman Corporation. Loop pile fabric. 4,404,999, Cl. 139-391.000.

Woodcock, Maurice L., to Monsanto Company. Processes for severing hollow fiber membranes. 4,405,536, Cl. 264-25.000.

Woodman, Alan L.: *See*—
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,405,984, Cl. 364-410.000.

Woods, Jonathan L.; and Sutton, Leroy A., to Zenith Radio Corporation. Over voltage circuit for a switching regulator power supply. 4,405,964, Cl. 361-18.000.

Woodson, Herbert H.: *See*—
Weldon, William F.; and Woodson, Herbert H., 4,405,965, Cl. 361-43.000.

Woolfson, Martin G.; and Romanski, John G., to Westinghouse Electric Corp. Apparatus and method for preprocessing video frame signals. 4,405,940, Cl. 358-93.000.

Wormsbacher, Wilfried: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Wormsbacher, Wilfried, 4,405,603, Cl. 424-101.000.

Woutat, Wilson A. Leash with remote latch release. 4,404,927, Cl. 119-114.000.

Wovcha, Merle G.: *See*—
Knight, John C.; and Wovcha, Merle G., 4,405,525, Cl. 260-397.100.

Wright, Anthony R., to W & A Bates Limited. Reinforced structures. 4,405,395, Cl. 156-117.000.

Wu, Kuoeng F. Adjustable looseleaf binder. 4,405,250, Cl. 402-13.000.

Wu, Mu-Yen M.; and Ball, Lawrence E., to Standard Oil Company. Preparation of a polyamide from lactam, ammonium salt of unsaturated acid and unsaturated nitrile. 4,405,777, Cl. 528-323.000.

Wuerzer, Bruno: *See*—
Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, 4,405,358, Cl. 71-98.000.

Wunderlich, Klaus; Schlegel, Udo; and Ricke, Heinz, to Olympia Werke AG. Advancing device in electrically driven typewriters and similar machines. 4,405,248, Cl. 400-550.000.

Wurtman, Richard J., to Massachusetts Institute of Technology. Process for increasing glycine levels in the brain and spinal cord. 4,405,629, Cl. 424-267.000.

Wurzburg, Henry, to Motorola, Inc. High pass filter and method of making same. 4,405,899, Cl. 330-107.000.

Wyder AG.: *See*—
Possl, Hans, 4,405,096, Cl. 242-199.000.

Wydro, Jan J.; Scholl, Charles H.; and Coker, William R., to Nordson Corporation. Method and apparatus for controlling the density of dispensed hot melt thermoplastic adhesive foam. 4,405,063, Cl. 222-146.0HE.

Wyzsza Szkola Inzynierska Im. Jurija Gagarina: *See*—
Bacal, Kazimierz; Wierusz, Lech; and Kossek, Stanislaw, 4,404,967, Cl. 128-69.000.

Xerox Corporation: *See*—
Chen, Tu, 4,405,677, Cl. 428-172.000.
Kay, David B., 4,405,207, Cl. 350-320.000.
Marshall, Sidney W., 4,405,956, Cl. 360-78.000.
Poleshuk, Michael, 4,404,731, Cl. 29-571.000.
Williams, David J.; Meredith, Gerald R.; and Olin, George R., 4,405,733, Cl. 524-87.000.

Y K Trading Kabushiki Kaisha: *See*—
Yamashita, Hiroyuki, 4,405,177, Cl. 299-41.000.

Yada, Isao: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shigemura, Yutaka; Yada, Isao; Irie, Yoichiro; and Morimoto, Kiyoshi, 4,405,226, Cl. 355-14.00D.

Yale, Ramon L., to GTE Products Corporation. Terbium activated yttrium gadolinium oxysulfide X-ray phosphor and screen containing the same. 4,405,691, Cl. 428-690.000.

Yamada, Hideto: *See*—
Yoshioka, Shigehiko; Yamada, Hideto; and Asakura, Akira, 4,405,408, Cl. 162-158.000.

Yamada, Osamu: *See*—
Masuda, Yoshio; Miyazaki, Takeaki; Yamada, Osamu; and Hiramoto, Akira, 4,405,866, Cl. 290-53.000.

Yamada, Tetsuo: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Yamada, Tetsuo, 4,405,589, Cl. 423-344.000.

Yamada, Yasuyuki; Tsuji, Nobuo; Okita, Tsutomu; and Mukunoki, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,405,481, Cl. 252-62.540.

Yamagishi, Frederick G., to Hughes Aircraft Company. Moisture-protected alkali halide infrared windows. 4,405,692, Cl. 428-696.000.

Yamagishi, Masahiko: *See*—
Omori, Takashi; Koguchi, Kenji; Yamagishi Masahiko; and Takeuchi, Higehumi, 4,405,951, Cl. 358-256.000.

Yamaguchi, Masayuki: *See*—
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.

Yamamoto, Hideaki: *See*—
Baji, Toru; Koike, Norio; Tsukada, Toshihisa; Takemoto, Iwao; Yamamoto, Hideaki; and Takasaki, Yukio, 4,405,935, Cl. 357-31.000.

Yamamoto, Hideharu: *See*—
Kosaka, Hideki; Mimata, Tsutomu; Shimizu, Tsuyoshi; Yamamoto, Hideharu; Itoh, Kaoru; and Shima, Yasuhusa, 4,405,242, Cl. 368-82.000.

Yamamoto, Hiroshi; Uchidoi, Masanori; and Kawamura, Masaharu, to Canon Kabushiki Kaisha. Mode setting device for camera. 4,405,222, Cl. 354-238.000.

Yamamura, Hiroshi: *See*—
Nishimura, Tamio; Miyamoto, Yoshiko; Ohyama, Hiroshi; Yamamura, Hiroshi; Morita, Ken; Matsumoto, Kuniomi; and Watanabe, Tetsuro, 4,405,743, Cl. 424-321.000.

Yamane, Yukio; Yoshiyuki, Kazuhiko; and Endo, Toshiaki, to Nissan Motor Company, Limited. Window structure of a vehicle body. 4,405,174, Cl. 296-201.000.

Yamaoka, Nobutatsu: *See*—
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,472, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,473, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,474, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,475, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,476, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, 4,405,477, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,478, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Fujimoto, Masayuki, 4,405,479, Cl. 252-62.3BT.
Murase, Kiyoshi; Yamaoka, Nobutatsu; and Onigata, Kazuji, 4,405,480, Cl. 252-62.3BT.

Yamashita, Hiroyuki, to Y K Trading Kabushiki Kaisha. Apparatus for finishing surfaces. 4,405,177, Cl. 299-41.000.

Yamauchi, Kogi: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Kogi; and Suzuki, Mitsuo, 4,405,923, Cl. 340-825.560.

Yamauchi, Takashi: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,405,824, Cl. 570-144.000.

Yamauchi, Teruo; Ohyama, Yoshishige; Kuroiwa, Hiroshi; Fujieda, Mamoru; and Kirisawa, Tadashi, to Hitachi, Ltd. Air flow rate measuring device incorporating hot wire type air flow meter. 4,404,846, Cl. 73-118.000.

Yamazaki, Masafumi; and Suzuki, Mikio, to Nissan Motor Co., Ltd. Fuel supply system for an injection-type internal combustion engine. 4,404,944, Cl. 123-458.000.

Yanagawa, Hitoshi: *See*—
Inoue, Syunzo; Arai, Toshio; Nagasawa, Takeshi; Konishi, Motofumi; Yanagawa, Hitoshi; Iwaya, Toshio; and Kasuya, Michio, 4,405,227, Cl. 355-27.000.

Yanagita, Shuichi; Miyoshi, Tsutomu; and Miyane, Masashi, to Tanita Corporation. Electronic weighing apparatus of induction type. 4,405,025, Cl. 177-210.0FP.

Yang, Ling; Medico, Russell R.; and Baugh, Wesley A., to International Rectifier Corporation. Methods of producing spherical lithium aluminate particles. 4,405,595, Cl. 423-600.000.

Yanmar Diesel Engine Co., Ltd.: *See*—
Mori, Mitsuyoshi, 4,405,337, Cl. 44-56.000.

Yasuda, Mitsuo; Minami, Katsuji; Itokawa, Jiro; Aoto, Yoshiyuki; Hatakeyama, Yasuyuki; and Sakaida, Shinya, to Sharp Kabushiki Kaisha. Optical image synthesis method and apparatus. 4,405,219, Cl. 353-37.000.

Yeda Research & Development Co., Ltd.: *See*—
Jagur, Joseph, 4,405,771, Cl. 528-266.000.

Yetter Manufacturing Co.: *See*—
Whalen, Bernard F.; and Roberts, Clifford J., 4,404,918, Cl. 111-85.000.

Yokohama Rubber Co., Ltd., The: *See*—
Watanabe, Hideo, 4,405,689, Cl. 428-467.000.

Yokoyama, Toshiharu: *See*—
Maki, Takao; Masuyama, Tetsuo; and Yokoyama, Toshiharu, 4,405,823, Cl. 568-801.000.
Yonekura, Seiji: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Kogi; and Suzuki, Mitsuo, 4,405,923, Cl. 340-825.560.
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Camera motor drive mechanisms. 4,405,221, Cl. 354-173.000.
Yoshida Kogyo, K.K.: *See*—
Shimai, Hideo, 4,404,722, Cl. 29-33.200.
Yoshida, Motoaki: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,405,679, Cl. 428-216.000.
Yoshida, Takashi: *See*—
Oishi, Kiyohiko; Suzuki, Yoshihiro; Kobashi, Kiyoshi; Matsumoto, Shinichi; Yoshida, Takashi; and Kogiso, Takeshi, 4,404,795, Cl. 60-274.000.
Yoshioka, Seishiro: *See*—
Komatsu, Toshiyuki; Fukaya, Masaki; Uzawa, Shunichi; Yoshioka, Seishiro; and Shirato, Yoshiaki, 4,405,915, Cl. 338-15.000.
Yoshioka, Shigehiko; Yamada, Hideto; and Asakura, Akira, to Seiko Kagaku Kogyo Co., Ltd. Cellulose processing agents and paper processed therewith. 4,405,408, Cl. 162-158.000.
Yoshiyuki, Kazuhiko: *See*—
Yamane, Yukio; Yoshiyuki, Kazuhiko; and Endo, Toshiaki, 4,405,174, Cl. 296-201.000.
Young, A. Steven; and Mason, Gorby C., to Young, A. Steven, a part interest. Wellhead security apparatus. 4,405,161, Cl. 285-80.000.
Young, Chung I.; and Barber, Loren L., Jr., to Minnesota Mining and Manufacturing Company. Catalyst system containing a fluorinated acid and a polyvalent tin compound. 4,405,497, Cl. 252-431.00R.
Young, James W.: *See*—
Makos, Ronald A.; and Young, James W., 4,405,275, Cl. 414-28.000.
Young, Lewis B.: *See*—
Stead, George E.; and Young, Lewis B., 4,405,818, Cl. 568-781.000.
Young, Peter L., to Sperry Corporation. Method of producing positive slope step changes on vacuum deposited layers. 4,405,658, Cl. 427-63.000.
Young, Rodney C.: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,405,624, Cl. 424-256.000.
Youngers, Stephen A.: *See*—
Paulin, Stephen V.; Hillard, Randy H.; and Youngers, Stephen A., 4,404,761, Cl. 37-191.00A.
Yu, Kin C.; and Kachemov, Angelo D., to Honeywell Information Systems Inc. Communication multiplexer having an apparatus for establishing a single line priority. 4,405,981, Cl. 364-200.000.
Yuge, Kiyohiro: *See*—
Fujita, Shoichi; Kodama, Katsuhisa; and Yuge, Kiyohiro, 4,405,682, Cl. 428-317.700.
Yuill, Robert D.: *See*—
Johnson, Irvin D.; Timlin, Gary M.; and Yuill, Robert D., 4,404,843, Cl. 73-49.200.
Yutaka, Ishii: *See*—
Funada, Fumiaki; Takamatsu, Toshiaki; Yutaka, Ishii; and Wada, Tomio, 4,405,209, Cl. 350-341.000.
Zabel, Jack H.: *See*—
Pritzkow, Dennis H.; Zabel, Jack H.; and Lang, George R., 4,405,863, Cl. 250-385.000.
Zachariadis, Robert G., to Mobil Oil Corporation. Method for collecting and generating composite trace signals with improved signal to noise ratios. 4,405,999, Cl. 367-23.000.
Zacharias, Ernst, to Matth. Hohner AG. Stringed instrument with keyboard, of the clavichord type. 4,404,884, Cl. 84-258.000.
Zaitsev, Valentin V.: *See*—
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.
Zama, Yoshimasa: *See*—
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,404,992, Cl. 138-140.000.
Zandona, Oliver J., to Ashland Oil, Inc. Method and means for charging foamed residual oils in contact with fluid solid particulate material. 4,405,444, Cl. 208-113.000.
Zanker, Dieter S. Firewood splitter. 4,405,005, Cl. 144-193.00C.
Zankl, Frank, to Kearney & Trecker Corporation. Machine tool operable as both a chucking type lathe and as a machining center. 4,404,727, Cl. 29-568.000.
Zardi, Umberto; and Comandini, Ettore, to Ammonia Casale S.A. Axial-radial reactor for heterogeneous synthesis. 4,405,562, Cl. 422-148.000.
Zebo, Timothy J., to Bell Telephone Laboratories, Incorporated. Echo canceler far end energy discriminator. 4,405,840, Cl. 179-170.200.
Zechlin, Richard; and Henderson, Robert M., to Colt Industries Operating Corp. Ignition control box assembly for internal combustion engine. 4,404,951, Cl. 123-595.000.
Zeger, Andrew E.: *See*—
Abrams, Burton S.; and Zeger, Andrew E., 4,406,016, Cl. 455-19.000.
Zeiringer, Rudolf: *See*—
Krempl, Peter; Zeiringer, Rudolf; and Claassen, Peter, 4,404,854, Cl. 73-730.000.
Zell, Reinhard: *See*—
Grass, Hansjorg; and Zell, Reinhard, 4,405,417, Cl. 204-73.00R.
Zemelman, Valery B.; and Kleiner, Fredric, to General Foods Corporation. Gasified ice process and product. 4,404,807, Cl. 62-1.000.
Zenith Radio Corporation: *See*—
Eilers, Carl G.; and Fockens, Pieter, 4,405,944, Cl. 358-144.000.
Hockenbrock, Richard L.; and Strauss, Paul, 4,405,949, Cl. 358-237.000.
Woods, Jonathan L.; and Sutton, Leroy A., 4,405,964, Cl. 361-18.000.
Zepp, Charles M.: *See*—
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,405,788, Cl. 546-165.000.
Zinkel, Duane F.; and Arimoto, Kunio, to United States of America, Agriculture. Preparation of esters of resin acids, resins, rosins, and derivatives thereof. 4,405,514, Cl. 260-102.000.
Zinn, Michael; Bauch, Tamil D.; and Schiff, Morton, to Raybend Associates. Large format film glazed solar collector. 4,404,962, Cl. 126-450.000.
Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst; and Guttler, Hermann, 4,404,791, Cl. 57-80.000.
Zinsmeyer, Thomas M., to Carrier Corporation. Method and apparatus for controlling the operation of a centrifugal compressor in a refrigeration system. 4,404,812, Cl. 62-84.000.
Zio, Cesare: *See*—
Masi, Paolo; Monopoli, Angela; Saravalle, Adone C.; and Zio, Cesare, 4,405,627, Cl. 424-263.000.
Ziolko, Eric F.: *See*—
Weiss, David L.; Ziolko, Eric F.; and Williams, Tim A., 4,406,010, Cl. 375-32.000.
Zitz, Alfred: *See*—
Sigott, Siegfried; Suessenbeck, Heinrich; Zitz, Alfred; and Siebenhofer, Gottfried, 4,404,893, Cl. 91-405.000.
Zlatkis, Anatoly D.: *See*—
Sheiko, Anatoly A.; Voloschenko, Mikhail V.; Latenko, Vladimir P.; Kartashevsky, Gennady R.; Schegolkov, Evgeny I.; Zlatkis, Anatoly D.; Osokin, Viktor G.; Polyakov, Lev V.; Zaitsev, Valentin V.; and Trunov, Mikhail B., 4,405,367, Cl. 75-124.000.
Zunker, Reinhard: *See*—
Fuchs, Otto; Hunger, Klaus; Weber, Dieter; and Zunker, Reinhard, 4,405,793, Cl. 548-131.000.
Zweymuller, Karl, to Sulzer Brothers Limited. Shank for a hip joint prosthesis. 4,404,693, Cl. 3-1.913.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayliss, John P., to Girling Limited. Anti-skid vehicle braking system. Re. 31,387, Cl. 303-115.000.

Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., to CasChem, Inc. Non-wicking polyurethane casting systems. Re. 31,389, Cl. 210-321.300.

Buschor, Josef J.: *See*—
Schmidt, Dieter K.; and Buschor, Josef J., Re. 31,385, Cl. 73-37.000.

CasChem, Inc.: *See*—
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., Re. 31,389, Cl. 210-321.300.

Case, Barton C.: *See*—
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., Re. 31,389, Cl. 210-321.300.

Davis, William F.; Russell, Ronald W.; Frederiksen, Thomas M.; and Long, Ernest L., to Motorola, Inc. Voltage and current regulator with automatic switchover. Re. 31,391, Cl. 361-154.000.

Frederiksen, Thomas M.: *See*—
Davis, William F.; Russell, Ronald W.; Frederiksen, Thomas M.; and Long, Ernest L., Re. 31,391, Cl. 361-154.000.

General Signal Corporation: *See*—
McEathron, Eugene D., Re. 31,386, Cl. 303-35.000.

Girling Limited: *See*—
Bayliss, John P., Re. 31,387, Cl. 303-115.000.

Harris-Hub Company, Inc.: *See*—
Mis, Frank J., Re. 31,384, Cl. 5-202.000.

Hellier, Stephen J.; and Passoni, Anselmo G., to SAES Getters, S.p.A. Air-bakeable water-proof getter device and method of manufacturing. Re. 31,388, Cl. 417-48.000.

Kroplinski, Thaddeus F.: *See*—
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., Re. 31,389, Cl. 210-321.300.

Long, Ernest L.: *See*—
Davis, William F.; Russell, Ronald W.; Frederiksen, Thomas M.; and Long, Ernest L., Re. 31,391, Cl. 361-154.000.

McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. Treatment of silica. Re. 31,390, Cl. 252-428.000.

McEathron, Eugene D., to General Signal Corporation. Fluid brake control system. Re. 31,386, Cl. 303-35.000.

Mis, Frank J., to Harris-Hub Company, Inc. Bed frame assembly. Re. 31,384, Cl. 5-202.000.

Motorola, Inc.: *See*—
Davis, William F.; Russell, Ronald W.; Frederiksen, Thomas M.; and Long, Ernest L., Re. 31,391, Cl. 361-154.000.

New Century Beverage Company: *See*—
Schmidt, Dieter K.; and Buschor, Josef J., Re. 31,385, Cl. 73-37.000.

Passoni, Anselmo G.: *See*—
Hellier, Stephen J.; and Passoni, Anselmo G., Re. 31,388, Cl. 417-48.000.

Phillips Petroleum Company: *See*—
McDaniel, Max P.; and Welch, Melvin B., Re. 31,390, Cl. 252-428.000.

Russell, Ronald W.: *See*—
Davis, William F.; Russell, Ronald W.; Frederiksen, Thomas M.; and Long, Ernest L., Re. 31,391, Cl. 361-154.000.

SAES Getters, S.p.A.: *See*—
Hellier, Stephen J.; and Passoni, Anselmo G., Re. 31,388, Cl. 417-48.000.

Schmidt, Dieter K.; and Buschor, Josef J., to New Century Beverage Company. Machine for testing bottles. Re. 31,385, Cl. 73-37.000.

Welch, Melvin B.: *See*—
McDaniel, Max P.; and Welch, Melvin B., Re. 31,390, Cl. 252-428.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Takahashi, Akira; Seki, Yasusuke; and Abe, Takeshi, 270,638, Cl. D14-80.000.

Alie, Enrique; Bishop, Donald R.; and Ryan, James M., to Polaroid Corporation. Photographic camera or similar article. 270,643, 9-20-83, Cl. D16-1.000.

American Hospital Supply Corporation: *See*—
Gallagher, Abigail H.; and Trudeau, Robert P., 270,596, Cl. D7-40.000.

American Telecommunications Corporation: *See*—
Bloem, Richard E., Sr., 270,635, Cl. D14-64.000.

Babson Bros. Co.: *See*—
Swanson, Harold V., 270,607, Cl. D7-368.000.

Barrett, James. Throwing ax. 270,654, 9-20-83, Cl. D22-1.000.

Benjamin & Medwin, Inc.: *See*—
Miller, David W., 270,598, Cl. D7-43.000.
Miller, David W., 270,600, Cl. D7-44.000.

Berlic, France. Stepstool. 270,590, 9-20-83, Cl. D6-32.000.

Binford, Robert O.: *See*—
McCrary, David N.; and Binford, Robert O., 270,606, Cl. D7-334.000.

Bird, Frank E., Jr. Chair. 270,589, 9-20-83, Cl. D6-30.000.

Bishop, Donald R.: *See*—
Alie, Enrique; Bishop, Donald R.; and Ryan, James M., 270,643, Cl. D16-1.000.

Bloem, Richard E., Sr., to American Telecommunications Corporation. Cordless telephone handset. 270,635, 9-20-83, Cl. D14-64.000.

Bobrovniczky, Bert, to Noma Canada Ltd. Right angled plug for electric cord. 270,628, 9-20-83, Cl. D13-28.000.

Caron, Jean P. Vehicle towing hitch. 270,626, 9-20-83, Cl. D12-162.000.

Cascone, Ernesto; and Cascone, Vincent. Combined door and frame structure. 270,665, 9-20-83, Cl. D25-48.000.

Cascone, Ernesto; and Cascone, Vincent. Door frame member. 270,666, 9-20-83, Cl. D25-74.000.

Cascone, Ernesto; and Cascone, Vincent. Door frame member. 270,667, 9-20-83, Cl. D25-75.000.

Cascone, Vincent: *See*—
Cascone, Ernesto; and Cascone, Vincent, 270,665, Cl. D25-48.000.
Cascone, Ernesto; and Cascone, Vincent, 270,666, Cl. D25-74.000.
Cascone, Ernesto; and Cascone, Vincent, 270,667, Cl. D25-75.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 270,669, Cl. D28-7.000.

Cassai, Henry J.; and Cassai, Gino H. Cosmetic applicator with universal joint. 270,669, 9-20-83, Cl. D28-7.000.

Check, Mathias M.; and Goodby, Elia L. Hand scoop for grass and leaves. 270,611, 9-20-83, Cl. D8-9.000.

Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Chair frame. 270,594, 9-20-83, Cl. D6-191.000.

Clivio, Franco; and Raffler, Dieter, to GARDENA Kress & Kastner GmbH. Sprayer. 270,657, 9-20-83, Cl. D23-37.000.

Collins, Walter W., to Jenkins Metal Corporation. Combination knife and utility tool with pivotal blade cover. 270,655, 9-20-83, Cl. D22-1.000.

Conti, Rino, to Dart Industries, Inc. Butter dish cover or the like. 270,597, 9-20-83, Cl. D7-40.000.

Conti, Rino, to Dart Industries Inc. Butter tray or the like. 270,605, 9-20-83, Cl. D7-84.000.

Cox, John A., to Liqui-Box Corporation. Jug. 270,616, 9-20-83, Cl. D9-378.000.

Creske, E. J. Waste receptacle. 270,677, 9-20-83, Cl. D34-8.000.

Culver Electronic Sales, Inc.: *See*—
Ungar, Leon B., 270,634, Cl. D14-36.000.

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747 4,404,855
765 4,404,856
827 4,404,857
861.02 4,404,858
861.18 4,404,859
861.78 4,404,860
861.83 4,404,861
864.16 4,404,862

CLASS 74

89.2 4,404,863
197 4,404,864
471 XY 4,404,865
546 4,404,866
665 GA 4,404,867
665 GE 4,404,868
740 4,404,869
829 4,404,870

CLASS 75

24 4,405,362
49 4,405,363
52 4,405,364
60 4,405,365
93 E 4,405,366
124 4,405,367
4,405,368
126 C 4,405,369

CLASS 76

25 A 4,404,871
4,404,872
82 4,404,873

CLASS 81

53.2 4,404,875
57.18 4,404,876
57.37 4,404,877
438 4,404,874

CLASS 82

2.5 4,404,878

CLASS 83

22 4,404,879
42 4,404,880
167 4,404,881
869 4,404,882

CLASS 84

1.03 4,404,883
258 4,404,884
329 4,404,885
471 R 4,404,886

CLASS 89

1.816 4,404,887
26 4,404,888
36 A 4,404,889
41 E 4,404,890

CLASS 91

45 4,404,891
396 4,404,892
405 4,404,893
461 4,404,894
488 4,404,895
491 4,404,896
506 4,404,897

CLASS 99

331 4,404,898
332 4,404,899

CLASS 101

40 4,404,900
93.02 4,404,901
122 4,404,902
123 4,404,903
126 4,404,904
183 4,404,905
211 4,404,906
228 4,404,907
349 4,404,908
350 4,404,909

CLASS 102

200 4,404,910
221 4,404,911
505 4,404,912

CLASS 104

12 4,404,913

CLASS 106

20 4,405,370
21 4,405,371
90 4,405,372
100 4,405,374
198 4,405,373
277 4,405,375
300 4,405,376

CLASS 108

9 4,404,914
43 4,404,915

CLASS 109

67 4,404,916

CLASS 111

3 4,404,917
85 4,404,918

CLASS 112

121.11 4,404,919
121.15 4,404,920
291 4,404,921

CLASS 116

206 4,404,922
214 4,404,923
270 4,404,924

CLASS 118

506 4,404,925
641 4,404,926

CLASS 119

114 4,404,927

CLASS 122

32 4,404,928
412 4,404,929
451 R 4,404,930

CLASS 123

179 H 4,404,931
4,404,932
187.5 R 4,404,933
190 BD 4,404,934
193 P 4,404,935
196 R 4,404,936
198 F 4,404,937
256 4,404,938
333 4,404,939
335 4,404,940
339 4,404,941
352 4,404,942
458 4,404,943
4,404,944
478 4,404,945
486 4,404,946
527 4,404,947
546 4,404,948
557 4,404,949
572 4,404,950
595 4,404,951
602 4,404,952

CLASS 126

77 4,404,953
121 4,404,954
4,404,955
293 4,404,956
419 4,404,957
426 4,404,958
429 4,404,959
432 4,404,960
4,404,961
450 4,404,962

CLASS 127

46.2 4,405,377
55 4,405,378

CLASS 128

4 4,404,963
4,404,964
46 4,404,965
69 4,404,966
4,404,967
79 4,404,968
201.23 4,404,969
325 4,404,970
348.1 4,404,971
419 PG 4,404,972
654 4,404,973
670 4,404,974

CLASS 130

27 JT 4,404,975

CLASS 131

339 4,404,976

CLASS 132

88.7 4,404,977
91 4,404,978

CLASS 134

2 4,405,379
166 C 4,404,979

CLASS 135

102 4,404,980

CLASS 137

67 4,404,981
68 R 4,404,982
74 4,404,983
88 4,404,984
234.5 4,404,985
355.17 4,404,986
556 4,404,987
565 4,404,988
596.18 4,404,989
601 4,404,990
636.1 4,404,991

CLASS 138

140 4,404,992

CLASS 139

66 R 4,404,993
91 4,404,994
92 4,404,995
194 4,404,996
291 R 4,404,997
384 B 4,404,998
391 4,404,999

CLASS 141

198 4,405,000
220 4,405,001

CLASS 144

2 R 4,405,002
35 R 4,405,003
87 4,405,004
193 C 4,405,005

CLASS 148

2 4,405,380
4,405,381
9 R 4,405,382
9.5 4,405,383
9.6 4,405,384
11.5 A 4,405,385
4,405,386
11.5 R 4,405,387
36 4,405,388
37 4,405,389
4,405,390
403 4,405,391

CLASS 149

109.6 4,405,392

CLASS 152

170 4,405,006
353 R 4,405,007

CLASS 156

78 4,405,393
83 4,405,394
117 4,405,395
155 4,405,396
164 4,405,397
242 4,405,398
243 4,405,399
244.11 4,405,400
248 4,405,401
273.7 4,405,402
449 4,405,403
497 4,405,404
633 4,405,405
643 4,405,406

CLASS 160

213 4,405,008

CLASS 162

146 4,405,407

158 4,405,408

CLASS 164

413 4,405,009

CLASS 165

4 4,405,010
10 4,405,011
78 4,405,012
86 4,405,013

CLASS 166

72 4,405,014
267 4,405,015
337 4,405,016
382 4,405,017
37 4,405,018

CLASS 172

816 4,405,019

CLASS 173

89 4,405,020

CLASS 174

59 4,405,826
94 R 4,405,827
138 R 4,405,828

CLASS 175

48 4,405,021
85 4,405,022

CLASS 177

59 4,405,023
200 4,405,024
210 FP 4,405,025

CLASS 178

22.1 4,405,829
30 4,405,830

CLASS 179

1 D 4,405,832
4,405,836
1 GB 4,405,834
1 GS 4,405,835
4,405,837
1 MN 4,405,833
1 P 4,405,831
1 SD 4,405,838
84 C 4,405,839
170.2 4,405,840

CLASS 180

9.62 4,405,026
56 4,405,027
65 A 4,405,029
65 E 4,405,028
153 4,405,030
165 4,405,031
259 4,405,032

CLASS 181

110 4,405,036
120 4,405,033

CLASS 182

190 4,405,034

CLASS 184

1 D 4,405,035

CLASS 188

196 D 4,405,037

CLASS 192

4 B 4,405,038
58 B 4,405,039
67 R 4,405,040
98 4,405,041

CLASS 198

687 4,405,042
769 4,405,043

CLASS 200

11 R 4,405,841
17 R 4,405,842
44 4,405,843
50 A 4,405,844
67 DB 4,405,845
144 R 4,405,846
4,405,847
243 4,405,848
262 4,405,849

CLASS 202

200 4,405,409

CLASS 204

15 4,405,410
26 4,405,411
54 R 4,405,412
55 R 4,405,413
56 R 4,405,414
67 4,405,415
68 4,405,416
73 R 4,405,417
95 4,405,418
96 4,405,419
105 M 4,405,420
129.2 4,405,421
129.85 4,405,422
157.1 R 4,405,423
4,405,424
159.13 4,405,425
159.15 4,405,426
181 R 4,405,427
4,405,428
202 4,405,431
206 4,405,432
225 4,405,433
293 4,405,434
298 4,405,435
4,405,436
400 4,405,430
421 4,405,429

CLASS 206

44.12 4,405,044
534 4,405,045
557 4,405,046
570 4,405,047
582 4,405,048

CLASS 208

10 4,405,437
11 R 4,405,438
45 4,405,439
48 Q 4,405,440
61 4,405,441
107 4,405,442
113 4,405,443
4,405,444
120 4,405,445
188 4,405,446
251 R 4,405,447
262 4,405,448
350 4,405,449

CLASS 209

3 4,405,450
136 4,405,451
172 4,405,452
172.5 4,405,453
279 4,405,454
630 4,405,049
668 4,405,050

CLASS 210

191 4,405,455
195.4 4,405,456
225 4,405,457
242.3 4,405,458
321.3 Re.31,389
521 4,405,459
640 4,405,460
698 4,405,461
709 4,405,462
712 4,405,463
717 4,405,464
757 4,405,465
798 4,405,466

CLASS 211

49 D 4,405,052
57.1 4,405,051

CLASS 215

32 4,405,053
277 4,405,054

CLASS 219

10.55 A 4,405,850
76.13 4,405,851
121 LJ 4,405,852
121 PP 4,405,853
421 4,405,854
501 4,405,855

CLASS 220

215 4,405,055
271 4,405,056
346 4,405,057
458 4,405,058

CLASS 221

129 4,405,059
135 4,405,060

CLASS 222

21 4,405,061
102 4,405,062
146 HE 4,405,063
148 4,405,064
153 4,405,065

CLASS 225

43 4,405,066
65 4,405,068
93 4,405,067
4,405,069

CLASS 226

55 4,405,070

CLASS 227

7 4,405,071
10 4,405,072
120 4,405,073

CLASS 228

41 4,405,074
49 B 4,405,075

CLASS 229

3.5 MF 4,405,076
41 R 4,405,077
52 B 4,405,078

CLASS 235

381 4,405,856

CLASS 236

78 D 4,405,080

CLASS 238

282 4,405,081

CLASS 239

91 4,405,082
99 4,405,084
178 4,405,085
224 4,405,086
226 4,405,087
302 4,405,088
656 4,405,089

CLASS 241

3 4,405,090
33 4,405,091
294 4,405,092

CLASS 242

55.19 R 4,405,093
149 4,405,094
179 4,405,095
199 4,405,096
4,405,097
200 4,405,098

CLASS 244

1 R 4,405,099
3.1 4,405,100
17.27 4,405,101
45 R 4,405,102
60 4,405,103
122 AF 4,405,104
213 4,405,105

CLASS 248

102 4,405,106
122 4,405,107
206 A 4,405,108
215 4,405,109
221.2 4,405,110
544 4,405,111

CLASS 249

97 4,405,083
207 4,405,112

CLASS 250

211 J 4,405,857
221 4,405,858
229 4,405,859
288 4,405,860
305 4,405,861
318 4,405,862
385 4,405,863
441.1 4,405,864
442.1 4,405,865

CLASS 251

168 4,405,113

CLASS 252

1 4,405,467
8.5 B 4,405,468
28 4,405,469
32.7 E 4,405,470
34 4,405,471
62.3 BT 4,405,472
4,405,473
4,405,474
4,405,475
4,405,476
4,405,477
4,405,478
4,405,479
4,405,480
62.54 4,405,481
99 4,405,482
140 4,405,483
174.25 4,405,484
180 4,405,485
186.31 4,405,486
194 4,405,487
299.63 4,405,488
315.4 4,405,489
358 4,405,490
359 E 4,405,491
370 4,405,492
389 A 4,405,493
392 4,405,494
428 Re.31,390
429 B 4,405,495
429 R 4,405,496
431 R 4,405,497
432 4,405,498
4,405,499
433 4,405,500
452 4,405,501
455 R 4,405,502
455 Z 4,405,503
461 4,405,505
462 4,405,506
466 B 4,405,507
518 4,405,508
522 A 4,405,509
522 R 4,405,510
547 4,405,511
628 4,405,512
700 4,405,513

CLASS 254

29 A 4,405,114
106 4,405,115
122 4,405,116

CLASS 260

102 4,405,514
239 R 4,405,515
239.3 B 4,405,516
239.3 T 4,405,517
245.7 4,405,518
365 4,405,522
369 4,405,523
372 4,405,524
397.1 4,405,525
400 4,405,526
453 PH 4,405,527
465 F 4,405,528
4,405,529
465.5 R 4,405,530
501.12 4,405,531
816 R 4,405,532

CLASS 261

111 4,405,533

CLASS 264

3 C 4,405,534
11 4,405,535
25 4,405,536
45.4 4,405,537
45.5 4,405,538
77 4,405,539
106 4,405,540
107 4,405,541
109 4,405,542
123 4,405,543
127 4,405,544
144 4,405,545
159 4,405,546
171 4,405,547
176 F 4,405,548
188 4,405,549
216 4,405,550
245 4,405,551
272.19 4,405,553
300 4,405,554
315 4,405,555
513 4,405,556
515 4,405,557

CLASS 266

66 4,405,117
227 4,405,118

CLASS 267

64.22 4,405,119

CLASS 269

71 4,405,120

CLASS 270

58 4,405,121

CLASS 271

8 A 4,405,122
22 4,405,123
135 4,405,124
195 4,405,125
279 4,405,126

CLASS 272

62 4,405,127
117 4,405,128
130 4,405,129

CLASS 273

25 4,405,130
153 S 4,405,131
348.1 4,405,132
419 4,405,133

CLASS 277

3 4,405,134
11 4,405,135
12 4,405,136
153 4,405,137
235 B 4,405,138

CLASS 280

12 H 4,405,139
16 4,405,140
163 4,405,141
242 WC 4,405,142
403 4,405,143
404 4,405,144
432 4,405,145
4,405,146
443 4,405,147
491 E 4,405,148
602 4,405,149
603 4,405,150
612 4,405,151
625 4,405,152
629 4,405,153
686 4,405,154
802 4,405,155

CLASS 281

29 4,405,156

CLASS 283

58 4,405,157

CLASS 285

7 4,405,158
38 4,405,159
39 4,405,160
80 4,405,161
95 4,405,162
305 4,405,163

CLASS 290

53 4,405,866

CLASS 292

169.21 4,405,164
258 4,405,165
305 4,405,166

CLASS 294

70 4,405,167
103 R 4,405,168

CLASS 296

3 4,405,169
10 4,405,170
19 4,405,171
20 4,405,172
146 4,405,173
201 4,405,174
4,405,175

CLASS 299

17 4,405,176
41 4,405,177
81 4,405,178

CLASS 301

2.5 4,405,179
111 4,405,180

CLASS 303

9 4,405,181
23 R 4,405,182
35 Re.31,386
115 Re.31,387
119 4,405,183

CLASS 307

64 4,405,867
296 A 4,405,868
405 4,405,869
446 4,405,870
594 4,405,871

CLASS 308

2 A 4,405,184
6 C 4,405,185

CLASS 310

75 R 4,405,872
156 4,405,873
313 B 4,405,874
344 4,405,875

CLASS 313

30 4,405,876
318 4,405,877
346 R 4,405,878
386 4,405,879
467 4,405,880
480 4,405,881

CLASS 315

118 4,405,882

CLASS 318

6 4,405,883
85 4,405,884
254 4,405,885
376 4,405,886
443 4,405,887
803 4,405,888

CLASS 320

1 4,405,889
2 4,405,890
15 4,405,891

CLASS 322

89 4,405,892

CLASS 323

271 4,405,893
340 4,405,894

CLASS 324

83 D 4,405,895
208 4,405,896
782 4,405,897

CLASS 328

72 4,405,898

CLASS 330

107 4,405,899
151 4,405,900
261 4,405,901
271 4,405,902
284 4,405,903

CLASS 331

87 4,405,904
94.1 4,405,905
116 FE 4,405,906

CLASS 333

24.1 4,405,907
165 4,405,908
198 4,405,909

CLASS 335

202 4,405,911
210 4,405,910
260 4,405,912

CLASS 336

98 4,405,913

CLASS 337

152 4,405,914

CLASS 338

15 4,405,915

CLASS 339

14 R 4,405,187
17 C 4,405,189
17 CF 4,405,188
28 4,405,190
75 M 4,405,191
91 R 4,405,192
99 R 4,405,193
147 P 4,405,194
252 R 4,405,195
273 F 4,405,196

CLASS 340

347 DA 4,405,916
365 C 4,405,917
4,405,918
522 4,405,919
700 4,405,920
708 4,405,921
825.36 4,405,922
825.56 4,405,923
825.72 4,405,924

CLASS 343

5 PD 4,405,925
123 4,405,926
854 4,405,927
912 4,405,928

CLASS 346

76 PH 4,405,929
107 R 4,405,930
139 R 4,405,931

CLASS 350

96.15 4,405,197
96.19 4,405,199
96.21 4,405,200
4,405,201
96.29 4,405,198
168 4,405,203
174 4,405,204
255 4,405,205
318 4,405,206
320 4,405,207
341 4,405,208
4,405,209
345 4,405,210
349 4,405,211
589 4,405,202

CLASS 351

43 4,405,212
59 4,405,213
88 4,405,214

208 4,405,215
237 4,405,216

CLASS 352

84 4,405,217
108 4,405,218

CLASS 353

37 4,405,219

CLASS 354

25 4,405,220
173 4,405,221
238 4,405,222
293 4,405,223

CLASS 355

3 R 4,405,224
14 D 4,405,226
14 R 4,405,225
27 4,405,227
75 4,405,228
77 4,405,229

CLASS 356

5 4,405,230
34 4,405,231
121 4,405,232
237 4,405,233
239 4,405,234
246 4,405,235
301 4,405,237
350 4,405,236
401 4,405,238

CLASS 357

13 4,405,932
4,405,933
15 4,405,934
31 4,405,935

CLASS 358

13 4,405,936
40 4,405,937
44 4,405,938
65 4,405,939
93 4,405,940
104 4,405,941
119 4,405,942
133 4,405,943
144 4,405,944
154 4,405,945
192.1 4,405,946
193.1 4,405,947
198 4,405,948
237 4,405,949
248 4,405,950
256 4,405,951

CLASS 360

10.3 4,405,955
49 4,405,952
65 4,405,953
4,405,954
78 4,405,956
96.6 4,405,962
99 4,405,957
113 4,405,958
119 4,405,959
125 4,405,960
129 4,405,961

CLASS 361

16 4,405,963
18 4,405,964
43 4,405,965
80 4,405,966
124 4,405,967
154 Re.31,391
195 4,405,968
215 4,405,969
283 4,405,970
401 4,405,971
417 4,405,972

CLASS 362

34 4,405,973
362 4,405,974

CLASS 363

49 4,405,975
72 4,405,976
124 4,405,977

CLASS 364

200 4,405,978
4,405,979
4,405,980
4,405,981
4,405,982
4,405,983
410 4,405,984
423 4,405,985
434 4,405,986
483 4,405,987
502 4,405,988
525 4,405,989
703 4,405,990
715 4,405,991
748 4,405,992

CLASS 365

108 4,405,993
126 4,405,994
174 4,405,995
203 4,405,996

CLASS 366

89 4,405,239
101 4,405,240
111 4,405,997
264 4,405,998

CLASS 367

23 4,405,999

CLASS 368

63 4,405,241
82 4,405,242

CLASS 369

44 4,406,000
88 4,406,001
220 4,406,002

CLASS 370

3 4,406,003
15 4,406,004
63 4,406,005
85 4,406,007
119 4,406,006

CLASS 373

102 4,406,008

CLASS 374

46 4,405,243

CLASS 375

18 4,406,009
32 4,406,010

CLASS 376

233 4,405,558
247 4,405,559
4,406,011
414 4,406,012

CLASS 377

29 4,406,013
107 4,406,014

CLASS 378

050 4,406,015

CLASS 400

66 4,405,244
144.2 4,405,245
4,405,246
196.1 4,405,247
550 4,405,248

CLASS 401

182 4,405,249

CLASS 402

13 4,405,250

CLASS 403

9 4,405,251
11 4,405,252
231 4,405,253
246 4,405,254
402 4,405,255
408 4,405,256

CLASS 405

19 4,405,257
60 4,405,258
62 4,405,259
184 4,405,260
221 4,405,262
224 4,405,263
227 4,405,261
270 4,405,264

CLASS 406

109 4,405,265

CLASS 408

56 4,405,266
101 4,405,267
182 4,405,268
211 4,405,269

CLASS 409

244 4,405,270

CLASS 410

53 4,405,271

CLASS 411

41 4,405,272
43 4,405,273
249 4,405,274

CLASS 414

21 4,405,186
28 4,405,275
119 4,405,276
222 4,405,277
411 4,405,278
558 4,405,279
685 4,405,280
722 4,405,281
724 4,405,282

CLASS 415

14 4,405,283
174 4,405,284

CLASS 416

220 R 4,405,285

CLASS 417

1 4,405,286
48 Re.31,388
216 4,405,287
220 4,405,288
250 4,405,289
282 4,405,290
393 4,405,291
403 4,405,292
482 4,405,293
488 4,405,294

CLASS 419

28 4,405,295

CLASS 422

102 4,405,560
145 4,405,561
148 4,405,562
169 4,405,563
197 4,405,564
4,405,565

CLASS 423

15 4,405,566
17 4,405,567
21.1 4,405,568
27 4,405,569
43 4,405,570
53 4,405,571
54 4,405,572
150 4,405,573
157 4,405,574
167 4,405,575
181 4,405,576
223 4,405,577
4,405,578
4,405,579
226 4,405,580
4,405,581
228 4,405,582
4,405,583
4,405,584
4,405,585
233 4,405,586
235 4,405,587
340 4,405,588
344 4,405,589
347 4,405,590
4,405,591
421 4,405,592
458 4,405,504
574 R 4,405,593
579 4,405,594
600 4,405,595

CLASS 424

33 4,405,596
35 4,405,597
45 4,405,598
53 4,405,599
57 4,405,600
95 4,405,601
4,405,602
101 4,405,603
165 4,405,604
173 4,405,605
177 4,405,606
4,405,607
4,405,608
4,405,609
180 4,405,610
4,405,611
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363 4,405,798
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495 4,405,810

CLASS 564

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CLASSIFICATION OF DESIGNS

D2—	29	270,584		44	270,600		378	270,616	D14—	1	270,632		67	270,648		45	270,664
	184	270,585		46	270,601		415	270,617			270,633		69	270,649	D25—	48	270,665
D3—	32	270,586		70	270,603			270,618		36	270,634	D21—	31	270,650		72	270,668
D6—	11	270,587		77	270,604		424	270,619		64	270,635		173	270,651		74	270,666
	27	270,588		84	270,605		447	270,620		65	270,636		196	270,652		75	270,667
	30	270,589		319	270,602		456	270,621		66	270,637		245	270,653	D28—	7	270,669
	32	270,590		334	270,606		457	270,622		80	270,638	D22—	1	270,654		35	270,670
	146	270,591		368	270,607	D10—	2	270,623		100	270,639			270,655		38	270,671
	177	270,593		409	270,608		57	270,624	D15—	7	270,640		18	270,656	D30—	16	270,672
	178	270,592	D8—	4	270,610		121	270,625			270,641	D23—	37	270,657		39	270,674
	191	270,594		9	270,611	D12—	162	270,626		126	270,642		55	270,658		43	270,673
	197	270,595		01	270,609		181	270,627	D16—	1	270,643		69	270,659	D34—	5	270,675
D7—	40	270,596		10	270,612	D13—	28	270,628		14	270,644		127	270,660		7	270,676
		270,597		58	270,613		30	270,629		21	270,645		139	270,661		8	270,677
	43	270,598		383	270,615		38	270,630	D18—	7	270,646		155	270,662		40	270,678
		270,599	D9—	317	270,614			270,631	D19—	39	270,647	D24—	17	270,663			

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DESIGN PATENTS

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06 : 5,107
5,108

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